UNIV. OF
TORONTO
LIBRARY

Physical &
Applied Sci.
Serials

Techn. P.

Per Copy, 25 cents (1/-)
Per Year, Post free, $2.50 (10/6)

The Photo-Miniature

Vol. XI

is a monthly magazine of photographic information, edited by John A. Tennant, for the man who wants the plain facts about one thing at a time. It is unique among photographic journals in the following vital points. ¶ Each number is a complete book in itself. Each number deals with a different subject and tells all worth knowing about its subject. ¶ Its information is fresh and original, simply written, without waste of words or space, by practical workers from actual experience. Always clear and to the point, comprehensive, not long-winded. ¶ It is carefully edited, well printed and linen-stitched so that it opens flat like a book for easy reading. Its pages are compactly filled, giving as much information as the average dollar book, in flexible form, fitting the coat-pocket. ¶ A complete set of the magazine forms the most comprehensive library of photographic information in the English language. Apply to American publishers for quotation on complete sets. A list of the numbers in print is given on the following page. Many numbers are going out of print. Get what you want now, before it is too late. Many of the earlier (out of print) numbers are now selling at from 50 cents to $1.00 each. All the numbers in print can be obtained from dealers in photographic supplies, or booksellers and news-agents in all parts of the world.

PUBLISHED BY TENNANT AND WARD
AT 103 PARK AVENUE, NEW YORK
Chicago Wholesale Agents: Burke and James, Inc.
Agents for Great Britain: Houghton's, Ltd., London
Agents for Australasia: Kodak (Australasia) Ltd., Sydney

Again the warning—Get what you want while they can be had!

Too many people discover that they want this or that number of The Photo-Miniature Series too late—after it is sold out and gone. Then they have trouble in finding a dealer who has an odd copy, and often have to pay 50 cents to a dollar for the copy they want.

Many of the books in this series are the only books on their subject. All of them are worth many times their price, 25 cents each. No other books contain the same direct, practical information The Photo-Miniature offers. Why not look through this list of numbers in print and buy today what you think may need to help you get better results in your work with the camera?

Your dealer may have many of the other 80 titles which are not now obtainable from the publishers. Look over his stock and buy what you need now.

The Photo-Miniature Series

OF PRACTICAL HANDBOOKS ON PHOTOGRAPHY

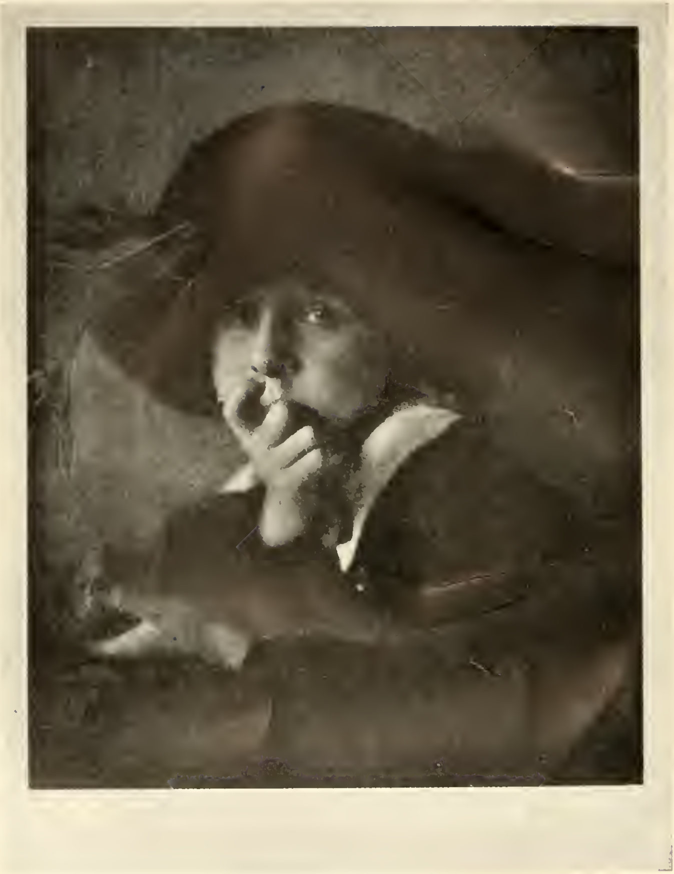
No.
44. Coloring Photographs
52. Aerial Photography (balloon)
55. Architectural Photography
60. Who Discovered Photography?
73. Panoramic Photography
77. Focal Plane Photography
84. Tank and Time Development
90. Practical Telephotography
92. Practical Orthochromatics
93. Development (Gaslight) Papers
95. Essentials in Portraiture
96. Leaves from an Amateur's Notebook
98. Stereoscopic Photography
102. Trimming, Mounting and Framing
103. Toning Bromide and Gaslight Prints
104. Night Photography
106. "Oil" and Bromoil Printing
108. The Six Printing Processes
109. Drapery and Accessories
111. Photography as a Business

No.
113. Zimmerman's Gumbichromate Method
115. Platinum Printing
116. Hand Work on Negatives
117. Outdoors with the Camera
119. The Optical Lantern
120. Marketing Photographs for Publication
121. Babies & children
122. How to Retouch Negatives
123 [illegible] Enlarging.
124. Photography for the Press
125. Pocket-Camera Photography
126. Putting Backgrounds in Portrait Negatives, Etching, etc.
127. Amateur Portraiture
128. All About Color Photography
129. Group Photography
130. How to Make Lantern-Slides
131. Simplified Photography
132. Getting Results with your Hand-Camera
133. Finishing Portrait Enlargements with Air-brush, etc.

Per copy 25c. [*1/-*] *Subscription $2.50 per year* [*10/6*]

FOR SALE BY ALL DEALERS

NEW YORK: TENNANT AND WARD, Publishers
CHICAGO: BURKE & JAMES, Inc., Wholesale Agents
LONDON: HOUGHTONS, Ltd., Agents for Great Britain
AUSTRALIA: KODAK (Australasia) LTD., SYDNEY



Boy with Apple

An example of the work of Mrs. G. A. Barton, one of the cleverest of English photographers of children

Reproduced, as this is, from a half-tone engraving, it hardly does credit to the exquisite qualities of Mrs. Barton's work, but I cannot forbear including it here to give my readers a glimpse of her wonderful skill.

The Photo-Miniature
A Magazine of Photographic Information
EDITED BY JOHN A. TENNANT
Volume XI AUGUST, 1912 Number 121

Making Pictures of Children

In my library there are ten large, fat scrap-books, containing almost three thousand pictures of what was once a baby and is now a boy—pictures of him in arms, pictures of him toddling with uncertain steps from chair to chair, walking, running; pictures of him alone, with his mother, with his uncles and aunts, his grandfathers and grandmother; pictures of him in summer and winter, in sunshine and shadow, in snow and rain, indoors and out, in quiet and happy and boisterous moods. Every picture is different from any other. Together they record a life-history covering seven and a half years of childhood.

That such a record is priceless in value needs hardly to be said. The point is this—and it may serve as the best possible introduction to my story: That, after twenty years filled with photographic experiences of the most varied sorts, I can say in all sincerity that the photography which has given me the biggest amount of pleasure and actual return for the time and money expended, which has yielded the biggest dividends on the capital invested, is my photographing of children—whether my own or belonging to others. It is, in truth, the one hobby of which I have never grown tired, and of which the results are never wearisome, but always more interesting as the years pass.

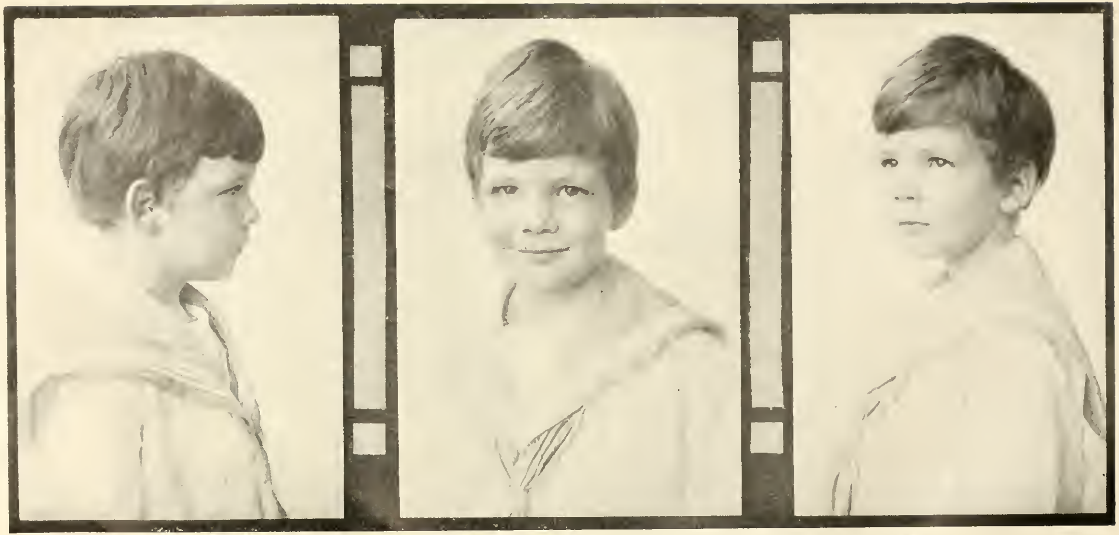
So much by way of introduction. What has yielded so much pleasure to one user of the magic black box, and has given back so generously in enjoyment to one parent, must surely hold something of joy for others who love children. For them this little book is written. If it possess any value to its readers, it will not be because it gives information in a dogmatic way or makes didactic assertions, or because the writer considers himself as an authority and uses the perpendicular pronoun in wholesale fashion; but simply because it is a record of personal experiences, the result of years of practice in its special field, the outcome of the personal solving of innumerable problems met and overcome as they came up. And how shall one write of personal experiences unless one says: "I did it!"

The Best Camera?

A question often asked me is: What is the best camera for the making of pictures of children? It is a question usually put by those who, looking over your collection of prints, will remark: "You must have a wonderful lens to get such good pictures." Apparently such inquirers think that it is the equipment, rather than the man behind it, which produces the result—that there is some magic in the form or type of the equipment, which enables some men to get clever pictures of children where others fail so miserably. This is not true. Different types of equipment do, without doubt, offer definite convenience and advantages in photographing children; but the fact remains that you can get the most delightful pictures of children imaginable with any sort of photographic equipment if you know how to go about it, and the circumstances are favorable to any limitations the equipment may possess.

I do not think there is any one best camera for work with the children. The majority of my pictures have been made with cameras of the reflecting-mirror type, yet some of the most cherished of them all were made with cameras of the folding pocket type, and I have seen hundreds of altogether charming pictures of child-life made with clumsy portrait cameras, or the equally cumbersome field cameras worked on the most awkward of tripods or stands.

By C. H. Claudy



An Example of Portraiture for Record. Profile, full and three-quarter views. Made once a year or oftener, these show the development of the child
By C. H. Claudy

An Attempt to Classify

But, while anxious to assure you who read that, be your equipment what it may, you can make pictures of children with it and make them well, it would be foolish to deny that some cameras are better adapted to the work than others. In the order in which they are desirable, I would catalogue the various types of instruments thus:

1. Reflex (reflecting-mirror) cameras.
2. Hand-cameras with exposure shutters, focal-plane or other types, permitting of extremely rapid exposures.
3. Folding hand-cameras with between-lens shutters.
4. "Fixed-focus" hand-cameras of the simplest form.
5. Tripod view cameras too heavy for hand use.
6. Portrait cameras, as usually made for home or studio portraiture.

It should be fairly obvious that a reflecting-mirror camera is *par excellence* the camera for use in making pictures of children, because children move rapidly, invariably assume the pose you most desire in the place you are not, and must be caught then or not at all; and because, in addition to permitting you to get a glimpse of the composition of the picture as a whole in the minimum of time, the use of the mirror insures you, even when working fast, a reasonably sharp focus where you want it. It has, of course, the further advantage of the focal-plane shutter, without which some children's pictures are fairly impossible (such as reasonably rapid snap-shots indoors), and with which I believe a certain quality of negative can be obtained, impossible to secure without it, when evenness of illumination plus a large volume of light with short exposure are considered.

For the same reason, the hand-camera without the reflex feature, but with the focal-plane or extremely rapid shutter, comes next in my opinion, closely followed by its near cousin, the folding hand instrument, or other camera not too cumbersome to be carried and manipulated without a tripod.

It may seem surprising that the simple fixed-focus box is listed as more desirable for children's pictures than the stand-camera, no matter how elaborate, or the heavy and cumbersome portrait-camera, yet I dare say any experienced worker in this field will agree that, if but one camera could be had for work on children, and that one must needs be either an 8 x 10 view camera, or a simple box camera of the fixed-focus type, the proper choice would be the smaller instrument, for reasons which should be evident, but which will be fully explained as we go along.

The Lens Question

The best of all lenses for child-picturing, whether in the studio or out of it, within the four walls of a home or underneath the blue sky, is a fast lens. Nor is the argument in favor of this simple proposition either long or complicated. Children move quickly, are full of action, life, *verve*. To "stop" them on the plate or film, to get action without blur or movement, one must needs have as rapid an exposure as may be given, up to the limits beyond which a plate begins to suffer from underexposure. By the same token, children are rounded and soft-contoured—we picture them mentally as bright, happy, full of color and joy—and no harshly contrasted photograph of jet blacks and staring whites ever gave such an impression to the beholder. And what lenses, other than fast ones, permit quick exposures plus full-timed negatives? Q. E. D.

But, lest this discourage those whose ambition or whose pocket-book does not encompass the sometimes high-priced anastigmat, let it be said at once that, albeit a fast lens is best for making children's pictures, it is by no means the only lens with which good work can be made. I have been accused at times of "faking" those little indoor snap-shots with which I illustrated the Kodak Baby Book, five years and more ago. They were honestly made, with a Kodak and ordinary Kodak lens, working at *f*/8. Indeed, dozens and dozens of my most cherished pictures of my little lad have been so made,—and I have seen many a picture of children made with lenses working at no faster a stop than *f*/16 which were in every way satisfactory. Such lenses may accomplish no less good work than fine lenses, within their range—only, that range is limited. With a lens working at $f/5$, or better, a new fairyland of childhood pictures opens to the photographer who has hitherto been restrained by the limits of his rapid rectilinear.

What Focus?

Almost as bad as the questions as to what lens and what camera, is that reading: "What is the best focus to use in picturing children?" It is assumed, of course, that the question touches the relation between the focal length of the lens and the size of the plate, since there can be no dogmatic assertion that any particular number of inches is the best to have in a lens focus, without qualifying such a statement with a note of the size of the plate to be covered. Nor even then is the question to be settled thus out of hand. Personally, I find that the most satisfactory lens for general all-round work with a 4 x 5 reflex camera is one of six inches focal length; but I am sure, if I made the statement outright that it was the most satisfactory focus, without qualifying the statement with the plate-size, there would be a small army to rise up and contradict me! Nevertheless, after trying all sorts of combinations, I do believe that the short-focus fast lens on the small reflex type of camera gives you the greatest number of successes in picturing children, because it gives a reasonable depth of definition, even working at its largest aperture,—which depth is often necessary if there are to be many children on one plate,—and because it allows you to work in confined situations—such as in small yards, playgrounds, woodland paths, etc., without the necessity to get far away from your subjects.

But those who are so fortunate as not to have to confine themselves to one lens on a reflex can derive the greatest possible comfort with a second lens of more than twelve inches focus for the same 4 x 5 plate, since the additional focal length thus gained permits picturing children from a distance sufficiently great to prevent the worker with the camera being too intrusive on his subjects at play. I have found such a lens of great assistance in picturing my lad with other children who were not so accustomed to the sight of "Old Pops" and the black box as is Carl, Jr.

Never having been confined to just one lens, I have had little experience with the convertible anastigmat in children photography; but, if one can make up one's mind to do without the extreme speed in the short-focus lens, perhaps a convertible lens of two or three foci might solve the lens problem very well indeed.

Coming down to the hand-cameras of the pocket folding class, the vast majority of which are supplied with rapid rectilinear lenses (*f*/8), it is, of course, hard to express an opinion as to the choice of lenses for such instruments, since, with a very few exceptions, such instruments are not listed in the catalogues with a choice of lenses. Rapid rectilinear lenses, however, as every one knows who has used them, are better if rather longer in focus for the size plate they are to cover, than the anastigmat of six inches focus for a 4 x 5 plate recommended as my personal choice. They cover better when longer in focus, and are thus more satisfactory.

Size of Camera

Again, no hard and fast rule—again, no real "best of all"—can be confidently proclaimed. But, also again, the personal choice is 2½ x 4¼, 4 x 5, or 3¼ x 5½. A 5 x 7 camera usually means too much weight and bulk for work outdoors, although very desirable for at-home work. Such cameras, particularly those of the reflex

By C. H. Claudy

type, are somewhat heavy and tiresome to carry patiently under one's arm all morning, even in your own front yard. Yes, you have to carry it—set it down for a few minutes' rest and behold, that is the particular instant chosen above all others for the formation of the very prettiest of compositions by your young subjects! The innumerable variety of small pocket-cameras, now so popular, many of them possessing truly remarkable efficiency, offers a big choice for those who must use small, portable equipments or none at all. Before buying such a camera, I advise a careful reading of THE PHOTO-MINIATURE, Nos. 97 and 100, in which the points of special advantage are cleverly set forth by a worker evidently familiar with his subject.

Film or Plate? Would I could dodge this never-settled question, or, failing that, ride rough-shod over it, with a few airy words of dismissal, or cut my way through it with a burning argument in favor of either! No matter what is said, the other fellows will be sure I am wrong! But if I may neither dodge nor go through nor over, nor yet dismiss the subject, I can compromise—and that is what I must do or fail in telling the truth. For the reflex with its supposedly fine and very rapid lens, it is un-

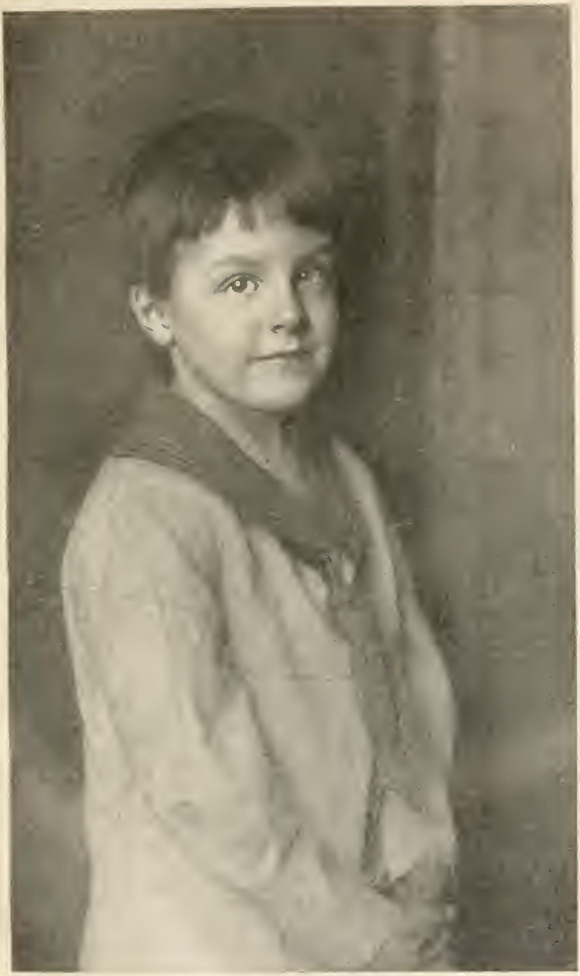
By C. H. Claudy

deniable that plates, with their flat and rigid surfaces, will yield sharper and crisper definition, most of the time, than will films; certainly if one uses so large an instrument as 5 x 7. Unquestionably, a plate with a baby picture on it handles just as much easier than a film, in the darkroom, as it does with any other kind of image upon it! And it is equally undeniable that for traveling, for country walks, for all occasions where weight is of the slightest consequence, a film, be it destined to record a baby smile or the antics of a steam-shovel, is always the lightest and most easily carried of the two forms of sensitive material! In my negative file are about as many plates as films—I cannot truthfully state a preference for one over the other except as size of material or distance to be traveled may dictate such preference. There is this single exception—except your plates be in a magazine plate-holder, which permits of an almost instantaneous change, there is no question but that films and their ready shifting from exposed to fresh sensitive surface, whether by the film winding-key or the black tab of paper in a film-pack, do permit of the making of series pictures—pictures in sequence of some act or play, which the slower method of changing plate-holders quite prohibits.

Outdoor Work

As regards children, it divides broadly into two great groups of pictures: those in which the subject is conscious that a picture is being taken,—is in fact, posing for it, and thus permitting the use of stops of any size, and time or bulb exposures,—and those photographs which catch on the fly the momentary pose, the bit of action, the unconscious grace of the child, unwatched, and with no cloak of that shyness or withdrawal into self which is the bitterest enemy of good child photography.

And right here let me answer publicly the question which is so often asked me when I boast (let us hope with due and becoming modesty) of my large collection of pictures of my little son. "Don't you fear to make him vain, with so many pictures?" they ask—these mothers and aunts and cousins. "Are you not afraid that, seeing his own face and figure so many times repeated, so carefully preserved in so many books, he



Contributed to the Competition: Pictures of Children by Women
By Alice Austin

will become unduly conceited?" And most roundly and most emphatically do I answer in the negative. It is not the many pictures, but the few, which make for vanity. Where the picture is an event—where the seldom-made visit to the portrait photographer is looked forward to with anxiety, prepared for with much washing of hands and arranging of hair and study of costume—the photographer may perhaps be considered in the light of a tool and trick of the Goddess of Vanity. But where photography is the common, everyday matter, as it is in the homes of those who follow the tantalizing will-o'-the-wisp of child photography, where the making of just one more photograph is about on a par with asking for one more slice of bread at table, there is no tendency for the results to turn to vainglory. We make photographs, my boy and I, for the fun of it. We like or dislike the results as they are attractive or ugly, interesting or tame, full of life or dead. We never like or dislike them (at least he doesn't!) because they are good likenesses or because they make him look "pretty!" Some one once said that there was safety in numbers, and it seems to apply in photographing children as well as anywhere else.

But I wander from my subject.

I cannot see that the making of a picture of a child, or of children, outdoors, in which the children are consciously posing, is any different in principle from making any other outdoor group; and, as such work is so well covered in so many different numbers of THE PHOTO-MINIATURE, I shall not attempt to go into this phase of the subject much more deeply than to caution the reader who has had little experience with children not to keep them waiting. Get your camera set up and focussed on the spot in which you wish the picture to be made, have all accessories in place, your plate-holder ready (if you use plates), and all the details arranged; then call and pose your little sitter or sitters. They tire quickly, the Little People, of sustained poses, and of doing things with little interest to them; hence, if you would not have boredom writ large over your picture, make it quickly, which means within a few minutes, after stopping play for the making of a pose.

Lighting: Outdoors

Bright day? Or dull day? Sunlight? Half-light? Shadow? Usually it's hard to choose between them—they all have such stunning effects "up their sleeves," as it were. But for the conscious picture outdoors, which is a portrait—that is, a single figure, or a group, to be made simply to get a likeness—either a bright day and the subject well in the shade, or a dull day, is certainly indicated. Shadows are softened, and eyes, from being holes burning in a blanket—as they so often appear in sunlit faces—emerge and show themselves to be really eyes, in the softer and more diffused light. True, such lights are apt to be flat; but, in a simple portrait, much better a flat light and a true rendition of the flesh values than a stunning lighting effect and no likeness at all.

When it comes to *genre* pictures which are posed—such as little groups at the tea-table, under the trees, wheeling the doll baby-carriage, posing with bat and ball, and the like, the brighter lights are usually the better. I am, personally, so out of sympathy with posing action, which can be so much better secured from real life, that I am perhaps not qualified to speak of this division of outdoor work. But I could never see the reason for posing a child in an attitude he will take in play, or asking him to "pretend" to do something for

By C. H. Claudy

picture purposes which he will do much more naturally in reality if you but give him a chance.

Children at Play

Here I must group all outdoor pictures which are of children doing anything, whether their play be real play or what is to them work. And it takes up so many different things that but a few can be mentioned in detail. Indeed, the broad principles are the same in all cases, whether the lad be coasting down hill in winter or playing ball in summer, whether his sister be starting to school in the fall or taking dolly for her first airing in the spring, the methods to be pursued are about the same. And, in all, the first and greatest question is, of course, exposure.

I am a rabid full-exposurist, if I may coin such a mouthful of a noun. Even as the devil is supposed to hate holy water, so I hate a photograph of a child with jet-black shadows, staring high lights, and middle tones conspicuous by their absence. Disagreeable as these features are in photography, they seem to me to be particularly objectionable in a picture of a child or a group of children, and while, of course, I must of necessity have made many such, they are waste-basketed as fast as made.

By the same token, too sharp a focus, too much

By C. H. Claudy

elaboration of detail, too microscopic definition, seem unnatural in pictures of the softly rounded and immature contours of childhood. And all these faults find their remedy in the fast lens, and the large opening. I dare say I make ninety pictures with the lens at *f*/4.5 for every ten with a smaller opening, managing the exposure with the shutter rather than with the stop. There are exceptions, of course, when depth of definition is a necessity; but, as a general rule, the large opening will be found the more effective. Nor does it mean necessarily high shutter speeds. With a between-lens shutter, such as one uses on most hand-cameras, the slow snapshot, yclept one-fiftieth of a second and usually about one-twentieth, will find use more often than the one marked one-hundreth or two-hundredth. In the focal-plane shutter, it is the edges of the one-and-one-half-inch slit and the three-quarter-inch slit which need reblackening most often.

In Winter

Particularly should this be so in winter, when snow is on the ground. The apparently simple proposition that because snow reflects much light, therefore snow pictures should have less exposure than the same scene in the same light without the snow, is a delusion and a snare. For if snow reflects much light, it also makes for much contrast. The way to cut contrast out of pictures is by full exposure and weak development. To get details in dark clothes, red cheeks, dark tree-trunks, and at the same time hold details in snow, give an ample rather than a short exposure, and let the development be slow and not too long.

Winter Action Pictures

Naturally, this rule cannot always apply. When you picture a snowball fight a swift coast down hill, or a skating scene, you must even take conditions as you find them—then the question of exposure is simplified to the proposition—find the greatest exposure which will "stop" the motion, and let the gradations take care of themselves as best they may. The reader is here referred to THE PHOTO-MINIATURE, Nos. 77 and 91, on speed work for such tables and data as are helpful in outdoor sports But on my own account I should like to say that if any

By C. H. Claudy

one with a slow-speed shutter or rapid rectilinear lens thinks he is cut off from children playing outdoors, let him remember that motion toward or away from the camera will permit a much, much longer exposure than motion at right angles to the instrument, and that he has always the resource of getting further away from the swift motion and thus reducing its speed upon the plate, with subsequent enlargement to give size in his prints. Distance also favors short exposures.

In Summer Meaning all the warm outdoor weather, children offer the most fascinating of subjects. And here exposures must be most carefully looked after, for over-exposure in summer means flatness, and flatness and a summer picture do not go well together, while the least under-exposure with strong sunlight means harsh contrast, which, as explained before, is, in pictures of children, anathema! This is particularly the case at the seashore. Conditions here are almost the exact opposite of those obtaining with snow upon the ground. Sand and sky, water and foam, all are light, bright, and "take" almost white. The natural background to any childish picture, here, is flat. Summer dresses are usually light in texture, and one is in danger of producing monotonous studies in the lightest and most vapory of tones if the large lens opening is not contracted a bit and the exposure proportioned to it. THE PHOTO-MINIATURE on seashore work (No. 28), goes into this question very

By C. H. Claudy

thoroughly—if it is still obtainable. Personally, I favor a dull day for seashore work with children.

The Question of Focus

Next to that of exposure, this is the most vital problem confronting the photographer of children. Nor is it solved with the reflex instrument with the ease which is so apparent in theory. With a large opening in the lens, the focus must be rather exact because of the lack of depth; and with small figures flying to and fro and back and forth it is by no means the easiest thing in the world to keep the one you want in focus, turn the camera to follow motion, see that the light is right, the distance what you want, the size of the figure what you plan, and at the same time watch out for the particular bit of action you desire to secure. Of course, it can be done, and is done, all the time, but not without practice. The suggestion is, therefore, offered that he who would take children in rapid motion should spend an hour or so in a playground with a reflex and, keeping it glued to his eyes and the lens at its largest opening, do nothing else but twiddle the focusing screw for that hour, in an endeavor to follow some flying body as it shoots-the-chute or plays a game of ball!

With the hand-camera of the scale-focusing type, there are two things which aid the securing of a swift and accurate focus, besides the absolutely indispensable one which the operator must possess—ability to judge distance by the eye. These two things are a rack-and-

By C. H. Claudy

pinion focusing device for his scale-focusing instrument, and a full appreciation of the fact that it is quicker and easier to move himself forward or back five feet, when working under a twenty-five foot distance, than it is to drop the eyes, find the scale, adjust the pointer, and look up, only to find the little figure gone or totally changed in position. As for leveling a non-reflex hand-camera, that simply must be left for instinct and practice. Be your camera ever so prettily decorated with silver spirit-levels with red liquid within, looking like junior apple-tarts, if you can't find and keep a level by the muscles of the hand which holds the camera, believe me when I say you will never do it with the level, unless, indeed, you can follow a level with one eye and subject with another!

Backgrounds

Sitting on a fence astride, and not knowing which garden is the more tempting, is not exactly an enviable position! Yet here is the opportunity to argue on both sides of a question, and I find myself trying to urge both sides of a controversy with equal emphasis and effect.

There is, all too often, too much attention paid to the background in making children's pictures—and

There is, all too often, not enough attention paid to the background in making children's pictures!

When the picture of the boy or girl is one in which the figure is incidental, a part but not the principal feature of importance in the photograph, then it is the background, the surroundings, and the composition as a whole, which make or mar the success of the effort. *Per contra*, when the picture of the boy or girl is one in which the boy or girl and his or her act at the moment is of prime importance, then it makes much less difference as to what the background may be or how it "composes." And if you ask me, "difference to whom?" I can only answer "to those who criticize a picture with some glimmerings of human intelligence, besides a knowledge of art principles."

To particularize, a picture of a hillside path, or a path through the woods, with a happy little figure riding along it on a stick-horse, may be beautiful or common-

By C. H. Claudy

place, be the beauty of the child what it may, according to the composition, the appropriateness of the background and the balance and "hang" of the whole thing. But a child coasting down hill, or careering over the the sidewalk on awkwardly managed roller-skates, taken, comparatively speaking, close to the figure, which thus becomes the main center of interest, may be wholly satisfactory and entertaining and enjoyable, even if not strictly beautiful, with no regard whatsoever to the variety and kind of background.

Height of the Camera

There is one little trick in child-picturing which is useful in eliminating impossible backgrounds and in emphasizing certain things, and that is in the management of the height of the camera. It is one of the things in which a hand-camera of the folding type is more convenient than one of the reflex type, the principal fault of which is that it is almost invariably used at the height of the user's digestive apparatus. If the background is unpleasing, and the picture is wanted never-

Afternoon Tea
By Mrs. Katherine Stanbery Burgess

Contributed to the Competition: Pictures of Children by Women
By Marion Creighton

theless, raising the camera up a little and pointing down will often eliminate much that is objectionable. Distortion? Of course! But what you do not see should not worry you, and unless some right lines be in the view the distortion will not generally be noticeable. If, on the contrary, the picture concerns itself with marbles, sand-pile play, digging or picking flowers, or any childish activity which takes place on the ground, in contradistinction to running, walking, jumping and game pictures, then it will frequently be found advisable and even necessary to get down on the ground too; and here the reflex camera is especially of service, since it shows "right-side-up and full size," to quote the advertisements, just the perspective which is to be taken, and lets you know without lifting your eyes from the instrument just when the hand or head or nose, or whatever you are most anxious to get properly into the photograph, is seen from the right elevation. Beware, however, getting low and far away at the same time, or your view will have a foreground remarkable principally for the gray fuzz which indicates out-of-focus earth and vegetation.

Methods of Work

I do not recall having read any treatise on photographing children which did not begin or end with, or have tucked away in its middle somewhere, a smug paragraph or two, with a "holier than thou" sound to it, treating of the necessity of loving your subjects, and of making them feel at home, of the need to set them at their ease, and of proving to the childish mind that you are one of them, in spirit, at any rate, in order that they may (I quote) "open up their confidence" and not "keep you upon the outside of their souls."

A Fallacy

Of course, if this sort of thing is an absolute necessity in a booklet on children's pictures, I will put it in. But I shan't do it gracefully, and I shan't believe in what I say. Oh, yes, I think those who love children can in all probability take better pictures of them than those who hate children (if there be such); but this twaddle about being "*en rapport*" with your sitter, when your "sitter" is a collarless boy with a dirty face, playing Indian, and being dragged around the back yard by two other lads, also without collars and with equally dirty faces, is somewhat affected, it seems to me. What you want is to make yourself as inconspicuous as possible, rather than as much "one of the gang" as you can. While my own lad is so used to me that he pays no attention to the camera when I point it at him, except to ask me, out of pure friendliness, occasionally, "Getting the kind you want, Pops?" I find that his little friends, even when they accept me as "one of themselves," do not "open up their souls" nearly so well as they do when they think I am not paying any attention to them. I take half a dozen for a walk, and join in the talk and laughter and throw stones, and all is well. I stop throwing stones and pick up the camera, and every last lad gets self-conscious but the one who knows all about it and doesn't mind. But

An Outdoor Suggestion
By Raimund F. Schmiedt, Berlin

suppose I take a friend along, and appear to be busily chatting—suppose I pretend to take some landscapes, and even invite a boy or two to "please move yourself out of my way—I want that tree, not *you*"—in half an hour I can swing that camera in their direction without their turning a hair or bothering about me at all. That, in my opinion, is worth forty attempts to be "one of the boys"—learn to be inconspicuous—to have them fail to regard you as anything but a part of the landscape, a necessary evil to be ignored—and you will get all the unconscious poses you want.

But it sometimes happens that the picture you most want just "won't happen." You want a picture of a lad dashing home from third base, and for an hour no one makes a hit long enough to get anyone on third base. You want Ruth and Nellie with their dolls "playing nurse," and those dolls are painfully healthy for a whole morning! You fancy a picture of Donald climbing a tree, and he elects to dig holes; or Jack turning a somersault, and he finds fascination in a book. Then, you will say, it is necessary to have the "rapport" thing with the children in working order.

My Way

Maybe. I don't know anything about it. When I want one child or half a dozen to do anything for some particular picture, I use only two methods, and one or the other has never failed yet. The first is to treat them as I would a group of grown folks.

"Will you boys all line up, right here, and let me get a picture of you starting down this hill?"

That happened this morning. There were twelve boys. Two were sulky—didn't want their picture taken—didn't want to go down that hill anyway—didn't want to oblige. Now I wanted as big a group as possible. How get those two boys to do what I wanted? I promptly slipped on the snow and sat down. *Eleven* boys set up a shout of laughter. One was won over—I had made him laugh.

"I want one boy to help me take one picture—which of you?"

The simultaneous shout of "me" from *twelve* throats announced that there were no more recalcitrants. I chose the twelfth boy, asked him to steady the camera while I stepped off and pressed the bulb, made a fake picture, asked him to step back so I could get him in a picture too, and got what I wanted. Make him laugh, arouse his interest in anything at all, and I don't care whether he likes me or not, I can get him to do what I want in a group.

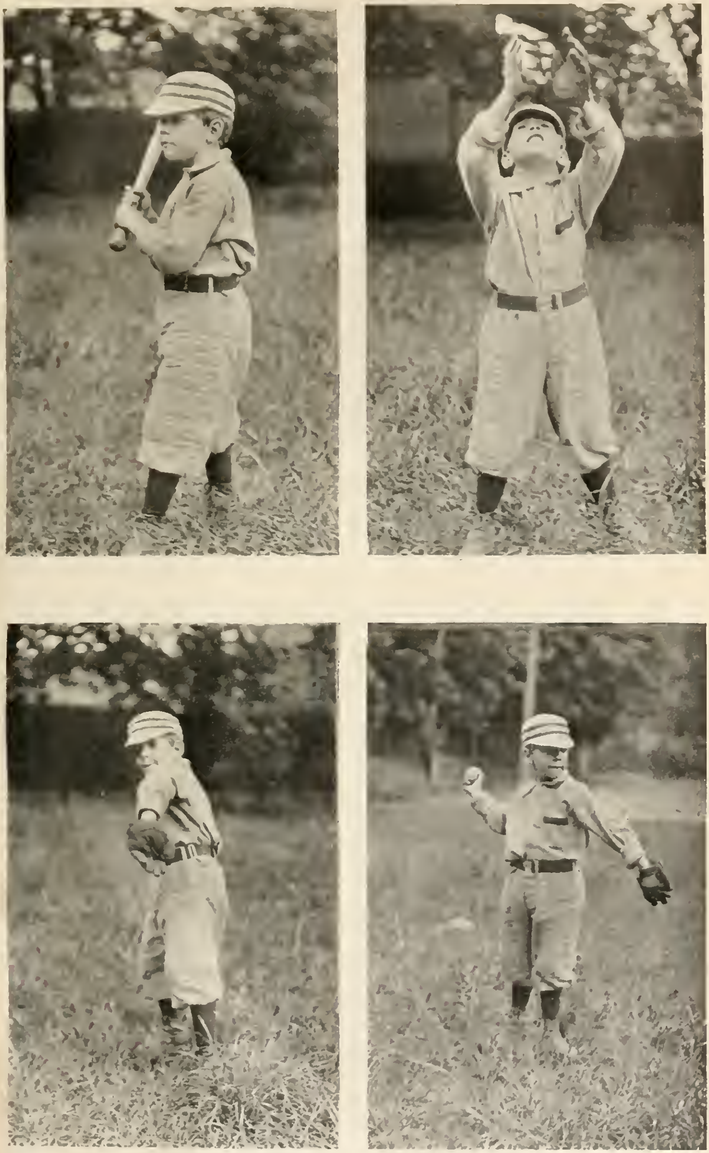
This is an extreme case. Generally I find that a group of children, the eldest of which is at least four, will do what you ask them to without any special knowledge of, or love for, the operator, if, as mentioned in the beginning, you neither keep them too long nor puzzle them with too many instructions. Under four, and unless you have trained them in the art of having their picture taken without paying any attention to you, and you will, in the long run, do better to wait for what you want rather than try to "force it."

Series Pictures

But while you wait for just what you want, there is a most fascinating opening presenting itself—a department of child-picturing which, all too often ending in failure, yet yields, when it does succeed, the happiest of results. This is the making of series pictures—two, three, four, five, or even more pictures in succession, showing different stages of some play, some act, some game, or merely different poses, which, preserved in some form in which the results are contiguous to each other, makes one of the happiest of children-picture exhibits.

How to Get Them

At the risk of losing whatever little reputation I may have managed to build among my readers for knowing anything at all of my subject, I must confess that the best of all ways to make a successful series is to make a whole lot of pictures in rapid succession and then pick two or three or more from the collection and show as the completed whole! I am thoroughly well aware that this is not a scientific way of doing business, nor even an artistic way, but I am certain it is a successful way! Shamelessly enough, I am quite willing to avow that one of my pet series contains four pictures picked from over two hundred! No, the two hundred were not made with the end of the series in mind—that was an after-



An Example of the Series Idea
By C. H. Claudy

thought. But it was a happy afterthought, and this particular set of pictures, which I termed "Smiles of the Seasons," shows a small boy all agrin in a tree, in May; smiling in a swing, in July; laughing with a bunch of goldenrod, in September, and joyfully throwing a snowball, in December!

But the series made with malice aforethought will usually be more successful as you make the more pictures, and from these six or eight or ten or twelve exposures you may be so fortunate as to get at least three which in themselves tell a little story, pleasant for you to show and quite charming to behold.

And if you ask me, "Where is the skill in so doing?" I must reply by inviting you to try such a series. Even though you use up a whole roll of film or box of plates, you may yet find that, lacking the judgment of just when to make the many snaps, you have not even three which "hang together" later on.

To be entirely successful, such series pictures must be wholly unconscious and without pose, and, to obtain this end, your sitters must disregard you entirely. Hence, it is much easier to get a good series of pictures with familiar models than with strange ones, and, if any shyness presents itself, the long-focus lens and the distant viewpoint recommend themselves.

Interior Work

This seems to divide itself logically into four separate parts—posed portraits, posed genre pictures, indoor snapshots, and flashlight work. Did I hear some one exclaim "indoor snapshots!" in an incredulous voice? Yea, indoor snapshots, as I shall try to explain.

Posed Portraits

They differ not at all when made of children, so far as method is concerned, from those of grown people, supposing the little one is old enough to understand and willing to be posed. Those numbers of THE PHOTO-MINIATURE which deal with home-portraiture and window-lighting will be found helpful in this field. My personal methods, if they have any interest, possess it because of their simplicity. I abjure the background, so called, and use the simplest of lightings, and nothing more than a sheet on a screen or chair-back is required, in my method of work, for a reflector. I prefer a south window to a north one (which is strictly against all text-book rules) because of the warmer and more abundant light; and, if there is the least sign of too much contrast in the resulting composition, I promptly cover the window with cheese-cloth, move the subject a little further back in the room, and go on with my work rejoicing.

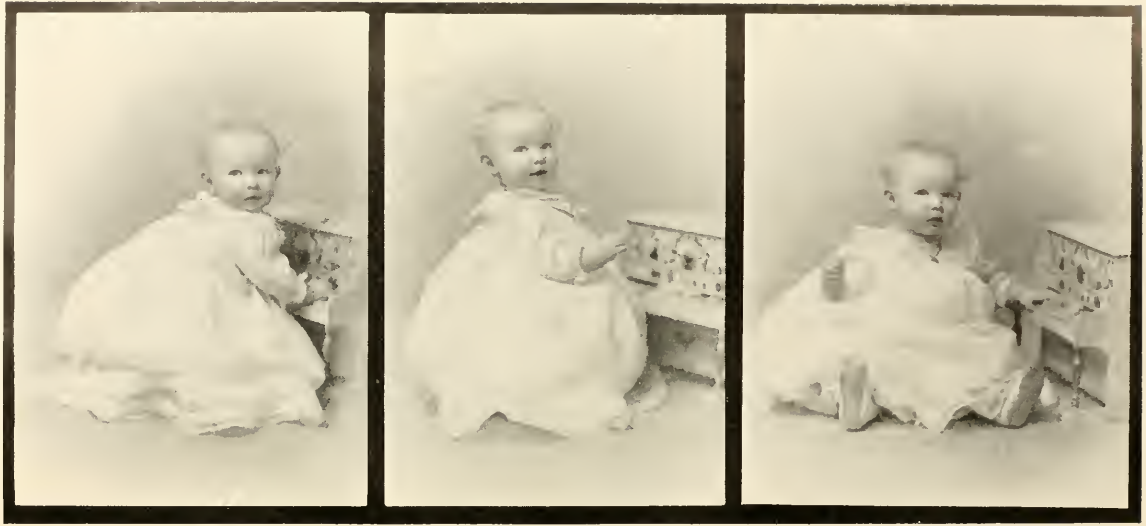
For work of this kind I still prefer the reflex type of instrument even to a good portrait camera, when working with children, on account of being able to get the pose I like best by a sudden caution to "please stand still, just that way—now—now," with the exposure made between "nows." With a portrait-camera, you either have to take your chance of missing a focus or of losing a pose, since there is no way with such instruments—or view-cameras either—of focusing through a plate-holder in position !

Posed genres

The same, only more so, as are *genre* pictures posed outdoors. One has the added difficulties of confined space, a light which is difficult to manage, and the problem of keeping a child still in a possibly strained position. Those which are easiest to make are those made closest to open windows and doors, with large and closely placed reflectors, window-seat pictures, building-blocks near open French windows with plenty of light in the room, conservatory pictures (if you can properly call photographs made in such floods of light indoor pictures), all commend themselves as being the easy way out of such difficulties. But, so far as making such pictures is concerned, I cut the Gordian knot by doing away with the one-, the two-, the three-second exposures, as well as those strains on childish patience and muscle, the ten- and twenty-second pictures.

Baby Pictures

Where no pose can be held, or in making pictures of very young children, who cannot be expected to stand or sit still (and who manage to live up to expectations very well indeed), success comes by the same simple magic, if magic it be. And if there is nothing else between these pages of any value, these next few paragraphs



Three charming poses of a very young child, sent me years ago by (I think) W. H. Partridge, of Boston should repay the reader for wading through the rest of it, and supposing he doesn't know this simple bit of photographic magic. Truly it is the

Meat of the Whole Book

Within certain limits it is not, as is often believed, the total amount of light received by the lens from any object which, in conjunction with the size of stop and speed of plate, determines the necessary exposure. It is the total amount of light, *plus the relation between the shadows and the highlights* which, in connection with the other well-known factors of lens-stop and speed of plate, should determine the exposure.

May I ask you to read that paragraph again? It is really important. For it is by a thorough understanding of this simple principle that one is to come by the magic of snapshots indoors, that one is able to reduce time-exposures to mere bulb-snaps, and make pictures of the Little People, even posed pictures with impossible attitudes, without movement and without wearying your naturally restless sitters.

For Example

Nor think I will leave it (and you) in this hazy state. Let us take a concrete example. I have here a little boy. The little boy is dressed in brown and white. He has on white stockings and black shoes. I place him carefully upon this fine old golden-toned Kermanshah, and, behind him, two thick red portières of beautiful drapery effect. I proceed to make his picture. As he is a very nervous little boy, I make just as short an exposure as I dare.

And the "Oh, how *cunning!*" of Mamma and Auntie might perhaps satisfy an audience less critical. But you will note, if you know photographs, that the shadows under the eyes are deep, and the boots of black seem welded to the fine old Kermanshah, which is surprisingly dark in tone, and that the place the fine old Kermanshah leaves off and the beautifully draped curtains begin is rather hard to find. He is a very white little boy indeed, both as regards face and dress, and, if I print deeply to bring out the detail in the dress, behold I have black stripes upon it where was brown in nature, and, if I am not very careful indeed, I shall, in such a print, have difficulty in assuring his friends that he has not turned negroid overnight!

But now for the other way. I have here a little girl. She also is dressed in white, trimmed with brown or blue or gray, or she may be dressed in light gray or blue. I stand her on a nice blue-and-white bathroom or bedroom rug. Behind her is a white or light-colored wall, and she is looking, perhaps, down upon a small table on which is a large book. And with the half of the exposure which wasn't enough for the little boy against the *dark* background, I catch the little girl, and get a fully timed, soft, and well-graded negative.

And how? The tale is as ancient as photography, yet, for some not-at-all-understood reason, not one child photographer in ten catches the trick.

"Expose for the shadows and let the highlights take care of themselves," is an old (and good) rule. But you can't expose for deep shadows, with children indoors, because they won't keep still long enough. Very well. *Then don't have any deep shadows!*

The Secret

There, it is out! *Have no deep shadows. Have the key of the whole picture high and light.* Have children dressed in light clothes, against a light background, with light floor-coverings under foot. Have plenty of things to reflect light. Have the contrasts as *little* as possible, and you may do almost what you will in slicing down the exposure, and still get enough light action on the plate to make a printable negative. Certain it is that by this simple trick, which is the whole Alpha and Omega of childish picturing inside the house, you can make all the snapshots indoors that you want. And while it is better and easier if you have a fast lens and a focal-plane shutter (with which I have frequently made fully timed negatives with the one-twenty-fifth of a second, and times without number made them in fifths and tenths, with the camera in my hand) such an outfit isn't necessary. With any hand-camera having a lens at *f*/8, a bright day, and a child properly dressed, properly "backgrounded" and lightly "floor-clothed," you can make exposures with the camera held in the hand, with a shutter exposure which is actually a fifth of a second, supposing you have the skill to hold the instrument still for that fraction of an instant. I am not talking theory —I am talking of what I have done, and surely what one can do another can also.

Why?

The principle, of course, is simple enough. With no deep shadows in which to need detail, requiring a long exposure to get it—with the whole picture one vast highlight, as it were—the exposure can be proportioned to that highlight. But, you argue, "I don't like such pictures—I think a child against a dark background stands out so beautifully."

Yes, I dare say. But who argues that way ignores two things. One is that to have the image " stand out " is neither so artistic nor so beautiful as to have the image " stand in," and the other that there is something inherently unmixable in children and darkness. I have never seen the picture of a child with a black background, that I have not wondered why the little man or woman was sad, and that no matter what the smile on the little face. Not only is this keeping the key of the picture high and light and bright the salvation of the photographer when it comes to making the negative, but it is also the most artistic, the most faithful to life, the most appropriate dress for a child's picture. Are they not, these Little People, happy? Are they not bright? Are they not incarnations of all that is joyous? Do they not stand to us all as symbols of happiness?

And whoever succeeded in picturing happiness in dark, somber, and mysterious tones? Of course, it is not always possible for the individual photographer to approximate the conditions required for snapshots indoors. Some people have no light rooms, others have no light-colored walls or screens in their light rooms. Of course, snapshots indoors to be made successfully, do require the maximum of light to be obtained indoors, and they do require that shadows be minimized both as to depth and number. They do require light clothing, plenty of reflectors placed close, and a constant memory of " high, light key throughout " singing through your brain.

But if you find you cannot get these conditions, and

Contributed to the Competition: Pictures of Children by Women.
By Clarissa Hovey

still must have a snapshot because of childish inability to stand still, or baby incapacity to understand what is wanted, improvise a "studio" on a porch. Nothing can be simpler with a little forethought.

Porch Photography

It is here that you may come the closest to approximating the finely lighted and carefully arranged pictures of the professional gallery—if that be any recommendation. Your studio is made by hanging sheets over clothes-lines stretched between pillars on the porch; your light is controlled by other cloths, opaque to light, which can be hung against the sheets on still other cords also stretched between pillars. Your background is yet another sheet, or even bed-spread (such photography makes vast demands upon the linen-closet). And if you pose your sitter three or four feet from the background and use a fast lens wide open, not a single bit of detail of cloth or pattern of spread will you get in the finished result, your image "standing in" against a background of white or lightest of tints, in most approved gallery fashion. Nor do you need much of any reflector here, just enough to lighten the slight shadows the least bit; a towel against a chair-back is all I ever find necessary. No, you cannot here easily secure line-light or Rembrandt effects, but you can get fine, broad lightings, excellent likenesses, and, since you can use rapid exposures, can catch many a fleeting expression, under cover of the porch roof, with a light that never was on sea or land where open sky throws down too much top light on your subject.

Flashlight Work

I approach the subject with reluctance. I am quite free to confess to both a personal timidity of the flash and a horror of something going wrong and involving a little sitter in a catastrophe. I never make flashlights of children if I can help it—and something always seems to be coming up and fixing me so that I can't help it! The boy has a party; or a friend wants a picture of little Susie, who is too delicate as yet to go out; or some one's baby must be pictured "before that cunning dimple is lost, and we cannot take him close to the window on account of his eyes;" and so it goes.

The Prize-Winning Picture in the Competition: Pictures of Children by Women

(Unfortunately, as often happens in these days of interpretative portraiture, this delightful print does not lend itself to satisfactory reproduction.—EDITOR P.-M.)

By Pearl Grace Loehr

And, while I have never had any flashlight trouble with babies, yet I live in hourly terror that I shall.

However, you can set that down to nerves, if you wish. When I do flashlight work, I use, in preference to all other means, a small charge of a compound powder and a flash-bag. I have tried all the various methods, many times, and personally my preference is as indicated. I find flash sheets excellent in trouble-saving and in good results, always supposing there is but one or at most two sitters, and those sufficiently *au fait* with the operation to sit still during the exposure. But when it comes to a wriggling baby, or a group of youngsters called from the supreme excitement of ice-cream and cake at a party, there is nothing for it but something so fast that they won't have time for even unconscious movement. Magnesium blow-lamps are, of course, utterly out of the question. Besides, one of those infernal machines nearly blew my head off once by imagining it was a steam-engine, making steam from wet powder and blowing its contents down my throat. I coughed magnesium powder and non-Sunday school language for an hour,—but that is another story altogether.

Advantages of the Bag

The flash-bag, made in simple form at small cost for the amateur, has many advantages. It diffuses the light to such an extent that screens and additional means for softening the light are unnecessary. It collects all the smoke, which can then be emptied outdoors. In addition to the convenience of this in preventing dirt and odors in the house, the use of the bag makes it perfectly possible to make any required number of flashes, one after the other, whereas the unbagged flash will smoke up things, so that often half an hour must elapse between flashes if the second is not to represent a house full of fog. No, I do not care to undertake the responsibility of recommending any particular flashlight equipment.

It is true that the use of a flash-bag gives a little more trouble than a flash-sheet. You have to insert the charge of powder, have the camera ready and, unless you are very skillful indeed, it is easier to have some one press the bulb for you and close it after the flash

By Elly Rintelen, Berlin

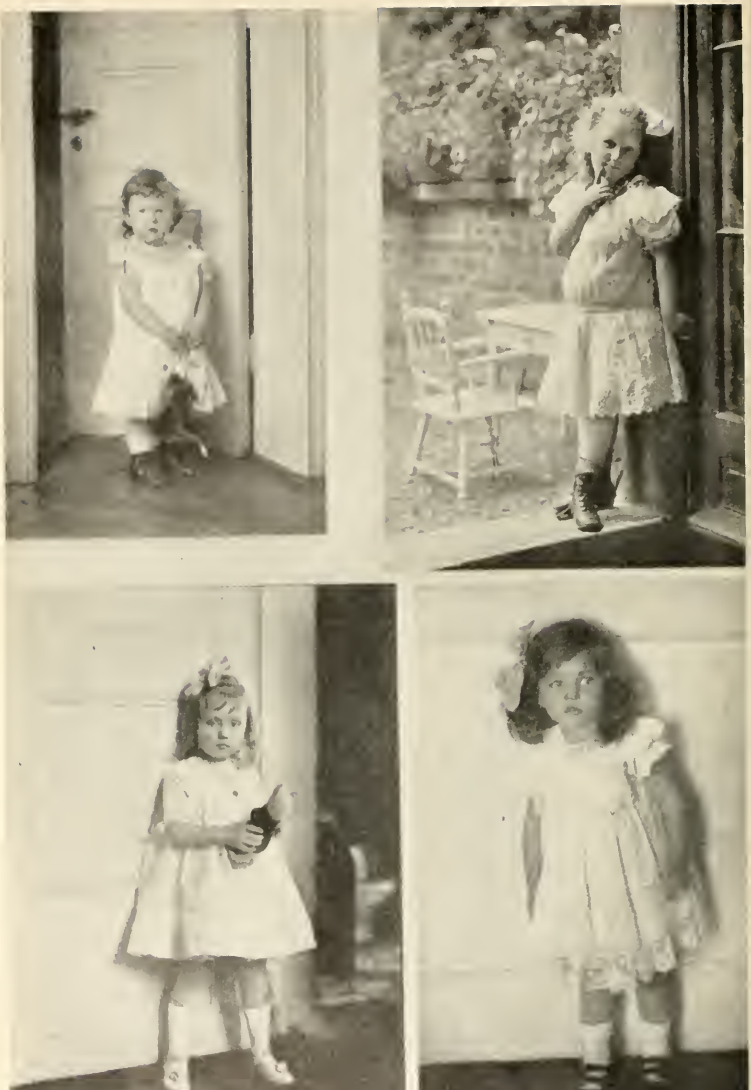
than it is to do both these things yourself. But the results are so much more satisfactory and less unpleasant in after-effects that the slight additional trouble is well worth the effort.

I find that, once in a while, a very nervous child, dreading the flash, will screw his or her face into a knot and await the "fireworks" in an attitude of terrorized delight. When confronted by such a sitter, it is well worth the time and trouble to let off a flash for experience only, to show its comparative noiselessness, and its utter harmlessness, then get ready to make your next picture, and see the rigid little faces smooth themselves out, now that there is no *unknown* experience ahead.

The same principles which make indoor snapshots possible by daylight apply in flashlight photography. Light clothes, light floors, light walls—the whole key of the picture light and high—will permit an excellently graded and fully exposed negative with half the powder required if dark shadows are allowed to intrude into the composition, and, incidentally, make a much prettier and more lifelike composition.

In the Darkroom

Happily for me, I do not have to tackle this well-worn subject from a new standpoint—indeed, from any standpoint. Developing a negative of a child or one of its grandfather is identically the same process. I use a tank, always, and alter the formula or the time only in one direction, if ever, and that is to dilute it or decrease the time of development, when I want to flatten out anything I am afraid of having too contrasty. As mentioned before, I am a hearty believer in as full exposure as can be given without stepping over the line into the realm of "badly over-exposed." I like my negatives a little inclined to be flat, and full of detail, and I like my prints as soft and gentle as possible, always bearing in mind the fact that softness does not necessarily mean monotony. Action pictures of children should not, generally, be so developed and printed that they are a series of slightly contrasting monotones about two shades apart in the total tonal scale, but, on the other hand, neither should they descend into stygian dark-



How German Photographers Picture the Little People
By (from left to right) Franz Rompel, Hamburg; E. Saurin-Sorani, Elberfeld; Wolffram & Co., Bremen, and Henry Traut, München

ness, or climb to the heights of dizzily brilliant high lights. The same cautions apply to printing.

Choice of Printing Papers

To my highly prejudiced mind, there is no paper like platinum for pictures of the Little People, since no other paper seems to have at once that combination of depth and brilliancy, softness and detail, rich gradation, length of scale and adaptability. But a busy day's work, often seven days in the week, leaves little daylight for most parents, hence the many satisfactory development papers have first call in my darkroom. Of them all, I prefer those papers designed for professional portraiture to any of the so-called amateur papers, when it comes to my pet baby pictures, for some of the same reasons given in favor of platinum, in which lack of contrast and long scale are the chief.

Enlargements

But this would be an ill-written booklet indeed did I neglect to mention that supremest of joys in baby picturing—enlarging, and the use of bromide paper. Hardly a negative of children but has some choice bit, which, picked out and by itself, becomes beautiful, with only size standing between it and appreciation. So an enlarging lantern or camera should certainly find place in the armory of the child photographer, and its battery be directed against a good many of the negatives he makes. He will find, even as have I, that the soft gray tones of the fully exposed bromide sheet, with not too great a scale of enlargement, and the beautiful texture of many of the rough papers now on the market, will provide him with finished pictures which are a joy to make and frame and live with. Make enough pictures of children and, be your lack of skill what it may, you are bound in time, if only from the certain and sure operation of the law of averages, to make an occasional ten-strike—a picture which is almost entirely satisfactory. But, if you don't watch these negatives and prints closely, you won't always recognize it. Not infrequently it is only a part of a whole, a picture within a picture, needing only separation from the rest and enlargement to make it a prized possession.

In conclusion I should like to say that I date each and every negative I make of my own small boy, and file those negatives with a card-index system; that all prints are dated and entered chronologically in big baby books, as I call them, regardless of what other prints and enlargements I may make of them. And this I can say, and want to say, with all the emphasis cold type can convey, and with all the sincerity I can muster to show through the printed page: Whether you picture children in general for the love of doing that which is at once difficult and dainty, aggravating and delightful, pleasure-giving and tantalizing; or whether you devote yourself and your camera in leisure moments to the preservation of the moods and likeness, the plays and works, the joys and sorrows of some one particular child or children, as I do, you will find, be your other photographic experience what it may, even as I have found, that not until you undertook the making of pictures of the Little People did you realize to the full all the joys of photography.

C. H. CLAUDY.

Notes and Comment

The Pictures of Children Competition, for women photographers, announced in THE PHOTO-MINIATURE No. 118, fell far short of my expectations—in results. Perhaps I expected too much. But it seemed to me that our women workers in photography should shine preëminently in this particular field. About one hundred prints were sent in for competition by some forty-odd photographers. The three or four which pleased me most are reproduced among the illustrations of this issue—a children's number. I wish that it were possible to show each one of my readers the clever bit of work by Miss Pearl Grace Loehr, of Flatbush, N. Y., to which the award went. The print is a gum-bichromate in sepia, about 5 x 8 inches, and gives one a really intimate glimpse of the subject of the picture. But our engravers confessed their inability to give it adequate reproduction, the scale of tones in the original being too restricted and subtle for rendition in halftone.

Looking over the prints carefully, I find two tendencies governing the women workers in the photographing of children. The one is to strive after professional studio effects of the strictly everyday sort. The other is to the excessive use of accessories and surroundings dark and heavy in tone. I regret to note these tendencies.

Some of the best portraits of children I have seen were shown by professional photographers at the recent National Convention in Philadelphia. Their charm lay largely in their simplicity, in the avoidance of professional posing and lighting, in the absence of any apparent striving after effect, in a lightness and daintiness of handling, and accessories (where these were used) that made the little ones look altogether charming and desirable. Simplicity and naturalness are the lines to follow in child portraiture. And the spirit of childhood seems to be more naturally and more pleasingly expressed in light rather than in dark tones.

I thank all those who sent me their work, whether for competition or "for the joy of it." Someday we will try again in this happiest of pictorial fields. Meanwhile I hope that those who read this number of THE PHOTO-MINIATURE will get pleasure and help from Mr. Claudy's account of his personal experiences.

⁂

The Eighth American Photographic Salon, at the Fine Arts Institute, Kansas City, Mo., seems to have attracted much favorable attention in that city last month. A notable feature was the section devoted to color photography, wherein some particularly good work was shown. Mr. E. J. Davison, who gave an illustrated talk during the holding of the Salon, tells me that he used a Bausch & Lomb Balopticon with a 15-25 ampere rheostat, and had no trouble in showing Autochrome slides with their normal brilliancy.

⁂

A handy darkroom convenience which is not as widely known or as widely used as it deserves to be, is Stiefel's Pumice Stone Soap, made by Schering & Glatz, 150 Maiden Lane, New York. I give the address because the reader will do well to send ten cents in stamps and test its convenience for himself.

⁂

Here is a formula for tank development with which I have had happy results during the summer. Notice the elasticity which permits of varying the time of development according to the needs of the spool of exposures in hand.

Make up a stock solution as follows: Dissolve 15 grains of Duratol in 20 ounces of hot water. Mix (dry) 1 ounce of sodium sulphite (dry) with 2 ounces sodium carbonate and add them (well mixed) to the duratol solution, stirring to hasten solution. When all is dissolved add 75 grains hydroquinone and then add sufficient water to make the solution up to 40 ounces.

Used as a normal developer for films or plates, this gives complete development in from 5 to 8 minutes. For tank development (at 65° Fahr.) take 1 part D-O stock solution and 1 part water for 15 minutes' development; or 1 part D-O stock solution and 2 parts water for 22 minutes' development; or 1 part D-O stock solution and 3 parts water for 30 minutes' development.

❧

In the June and July numbers of "Clinical Medicine," Dr. Malcolm Dean Miller, author of the monograph on "Beginners' Troubles:" THE PHOTO-MINIATURE, No. 114, gives a clear and practical exposition of "Medical Photography" with illustrations —which (as usual in these cases) should be seen after, not before, dinner.

❧

I suppose that most of my readers have seen the latest excitement, "Abel's Amateur Photographers' Weekly," at 5 cents the copy or $1 by the year. When the youngster fairly gets onto his legs, I fancy he will be a favorite. Ask your dealer to give you a copy.

❧

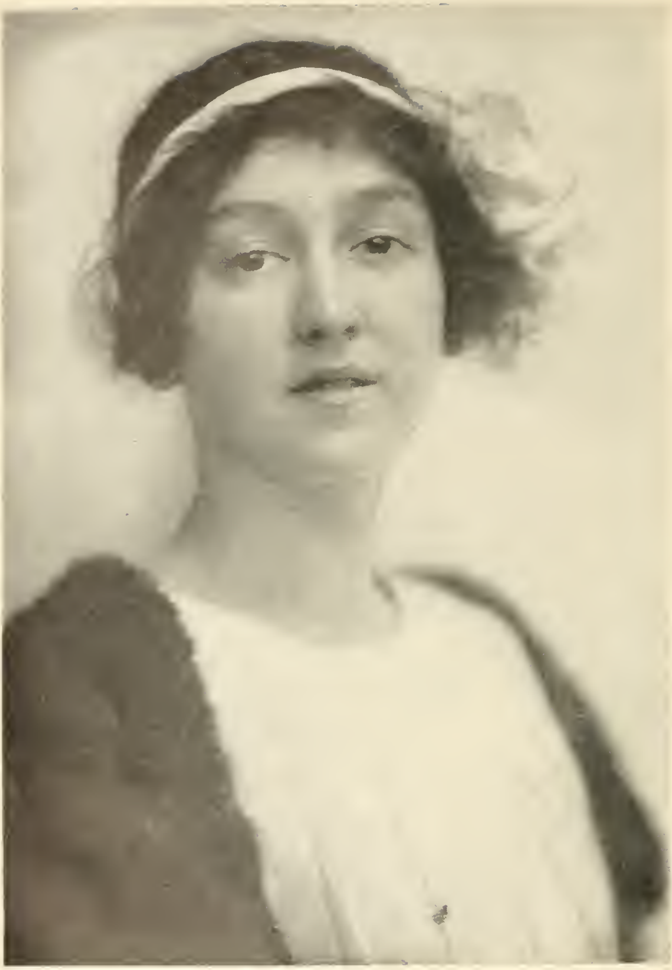
"Ansco Film" and "Cyko Paper" (Ansco Company, Binghamton, N. Y.) are two useful booklets which will repay careful perusal. They can be had for the asking from any Ansco dealer; but, by writing to headquarters as above, the reader can get a copy of the new Ansco 1912 camera catalogue and "Portrait" all well worth a postal card. The July number of "Portrait" contains a recent portrait and "Appreciation" of Gertrude Kasebier, the well-known portraitist, of New York.

❧

The lens-makers' catalogues of today are, without doubt, the most interesting specimens of trade literature, cleverly written and finely illustrated. I cannot see how any improvement could be made on the new catalogues just published by the Bausch & Lomb Optical Company, Rochester, N. Y., and Voigtlander & Sohn, Chicago, Ill. If the reader can relish half an hour of strenuous temptation and profitable suggestion, he should send for these catalogues and go through them from cover to cover.

❧

The New Mentor Reflex Camera introduced to this country by Kreps & Stelling, Augusta, Georgia, has a special interest for those who want successful pictures of children, or any other subjects requiring rapid exposures indoors or out. Together with the low-priced but thoroughly efficient Eurynar anastigmat lenses, this wonderful camera is described in a new catalogue just issued by Kreps & Stelling which they will gladly send to readers on request if they mention this note.



Portrait of a Young Girl, by S. H. Lifshey
Showing the soft round modeling and lack of texture desirable in such a portrait

The Photo-Miniature
A Magazine of Photographic Information
EDITED BY JOHN A. TENNANT

Volume XI JANUARY, 1913 Number 122

How to Retouch Portrait Negatives

What do we mean when we speak of retouching a negative? Very briefly, we mean a process employed in portrait photography, in which the negative is worked upon with a pencil, knife or brush and color for the correction of certain defects, the modifying of details, or the introduction of special effects, all intended to make it yield more pleasing prints than it could give in its original, untouched state. In earlier days the process was practically restricted to softening the lines and abruptness of the lights and shadows of the face in the negative by means of innumerable pencil touches, hence the word retouching. Today the word covers any and every method of hand-work on the film or glass side of negative which will give, in the print, a more effective or more desirable presentment of the subject. For example: If we look closely at a glossy print made from a portrait negative just as it left the drying rack, we shall see that it shows many little defects, such as minute transparent spots, patches of uneven density, heavily marked lines, wrinkles and shadows. Or it may be that the lines of a chair, or some details of the accessories, run awkwardly into the figure or head of the subject. We have all seen and lamented over these things. Sometimes we see the ornamental knobs of a chair-back appear as undesirable humps on a pair of beautiful shoulders; or an unruly strand of hair obtruding upon a fair face, or a flaunting piece of drapery playing havoc with the charming lines of a woman's dress. These defects may be the result of shortcomings in the photographic plate or film, or of faults in the composition and lighting of the subject, or of conditions peculiar to the subject itself. A yellowish tinge or mark on the face, perhaps imperceptible to the eye, will come out dark in the print; the rosy cheek, so delightful in life, appears as an unpleasing dark patch in the photograph; and the bluish gray shadows about the eyes and corners of the mouth photograph lighter than they appear in the face as ordinarily seen.

Why Retouch?

Many of these defects are inevitable and unavoidable in ordinary practice. They are all more likely to appear in the amateur's than in the professional's negatives, since the amateur can rarely control the local conditions so successfully as the professional in his studio. But they can all be remedied, modified or removed by skilful retouching, and, by the same means, many little improvements can be worked into the negative which will enhance the rendering of the subject as seen in the print. This accounts at once for the importance and popularity of the process, and the desire of amateurs and professionals alike to become expert in its use.

There are, to be sure, those who claim that retouching is not necessary, desirable or justifiable, on the ground that all the qualities and effects desirable in a good portrait can be secured without the aid of any after hand-work by the proper handling of the subject, correct exposure and development, and discrimination in the choice of printing papers. This broad claim raises a very big question, into which we will not enter here. The purpose of this little book is to teach the reader how to retouch his portrait negatives if he so desires, by presenting the simplest methods of securing the many advantages which the process offers for the helping and improvement of the average portrait negative.

Making it Simpler

Since, however, retouching is admittedly a remedial process, and prevention is always better than cure, it may be well to point out in the beginning that the reader who makes his own portrait negatives can save himself a lot of useless work in the retouching of them, by adopting the few following commonsense rules in his portrait work: Avoid harsh and abrupt lightings which accentuate facial defects and blemishes; diffuse and soften the light falling on the subject so far as this is consistent with the pictorial effects desired in the picture; avoid critical sharpness of definition, and try to secure softness or plasticity throughout the picture image by careful focusing; use ortho- or isochromatic plates, preferably those known as "panchromatic," i. e., generally color sensitive, whenever possible; give full exposure and aim for thinness and softness, with full gradation, in the development of the negative.

What We Need to Know

In its essentials, the retouching of portrait negatives is a very simple process. This essential simplicity of the work must be insisted upon all the way through. When skill comes, the average retoucher is apt to magnify his office and put far too much work into or onto his negatives. This is a fatal error. It gives splendidly modeled portraits without a trace of likeness to the originals. The would-be retoucher needs to know, first of all, how to look at a negative; to recognize its shortcomings and defects and the possibilities for improvement. An acquaintance with facial expression and the anatomical make-up of the face, head and neck will be very helpful to the reader who proposes to follow retouching as a means of livelihood. This subject is too big for adequate treatment here, but is being thoroughly covered in a series of illustrated papers appearing in *Abel's Photographic Weekly*, which should be seen by those interested. Next, it needs a practical knowledge of the principles of retouching, as they are set forth in these pages; and, finally, we need to know how to use the few tools which make up the retoucher's equipment.

Perhaps this sounds somewhat formidable for a beginning. Let the reader put fear aside. The work is absorbingly interesting. The elementary principles and manipulation can be understood in two or three simple lessons. To acquire expert skill demands, of course, patience and considerable practice. But the amateur can acquire all the skill he is likely to need, in his more or less restricted field of work, by a careful following of what these pages tell him and a few weeks' experience.

Equipment

The equipment required for retouching is simple and inexpensive. It comprises a desk; a few pencils; two or three small sable brushes; cakes or tubes of water-color; a small tube of Conte's crayon powder and a few small stomps for applying it; a piece of fine emery cloth for pointing pencils; a bottle of retouching varnish or medium; and a set of etching or retouching knives. Since good work depends so much upon the efficiency of one's tools, we will briefly discuss these in detail.

The Desk

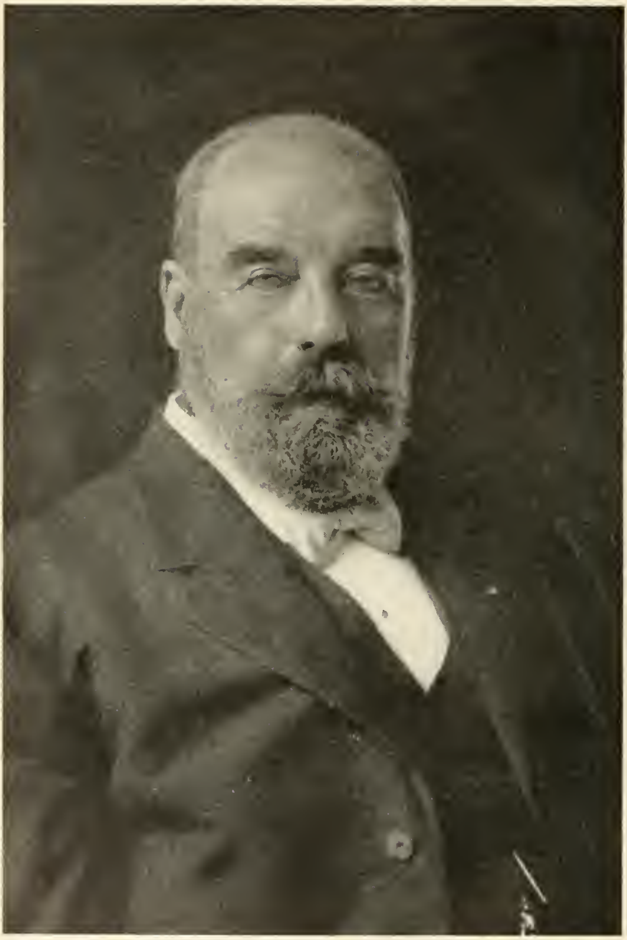
The retouching desk is is the most expensive item of the equipment. It can be bought from any dealer at prices ranging from $1.25 to $5, and will last a lifetime. The best desk for general use is one neither too light nor too bulky in construction, fitted to take negatives 8 x 10 or smaller, so as to allow for comfort in working. The inclined frame on which the negative rests should be fitted with a sheet of fine ground-glass, kept scrupulously clean, and having a thin wooden bar across it, to offer a rest for the retoucher's hand while working on the negative. The base frame of the desk, which rests on the work-table, is generally fitted with a reflecting mirror which throws the light up through the negative on the inclined frame. A sheet of white card will often be preferable to the mirror, as reflecting a quieter light, especially when very thin negatives have to be dealt with. The hinged hood of the desk, which is supported at a convenient angle over the inclined frame, is intended to screen the negative and the retoucher's eyes from distracting light while at work. Sometimes it is desirable to extend this light shield by hanging a piece of opaque fabric over the hood, so as to form a darkened chamber for the more comfortable viewing of the negative when, as often happens, the workroom is flooded with light. To set the desk up ready for work, place it on a conveniently high table facing a window, preferably with a north aspect, so that the light falls directly on the mirror or reflector. Fix the desk firmly to the table so that it will not slide, about five or six inches from the edge of the table, this working room being needed to support the elbow of the retoucher at work. Place the negative, film side up, on the groundglass and cover it with a piece of black or brown paper, having an oval aperture cut in it large enough to permit us to see the whole of the head and face in the negative. Sit upright at the desk, with the eyes twelve or fifteen inches away from the negative and slightly looking down at it, and you are in the correct position for examining or working on the negative.

Pencils

The retoucher's pencils must be of good quality, smooth, without grit and responsive to the touch. Faber's or Hardmuth's are generally preferred, in the form of long, loose leads which are used in a neat wooden holder similar to a hexagonal pencil of ordinary thickness. For the retoucher's use, the leads should be sharpened to a long, tapering point, projecting about an inch and a half beyond the metal nozzle of the holder. This long point is obtained by careful rubbing on the piece of fine emery cloth mentioned, which should be fastened to a thin strip of wood as a convenient base. The fine repointing of the pencil during use is generally done on a piece of smooth card kept at hand for this purpose. The choice of a pencil varies with the individual or the character of the negative to be retouched, HB, H, HH and HHHH being the degrees generally in use. Similarly the fineness or bluntness of the working point is a matter of personal choice and, of course, must be varied according to the size of the head under treatment, or the character of the touch desired. In retouching, the pencil should be held loosely, as one holds a pen when writing, not held rigidly, and tipped slightly to give a convenient angle for working on the film.

Brushes

The brushes should be red sable of good quality (Nos. 1 and 2). A good brush tapers evenly to a fine point, without stray hairs projecting. To test a brush, wet it and squeeze the superfluous water out. Now press the point on the thumb nail, bending the brush sideways.



Portrait by S. H. Lifshey

By comparing this with the unretouched portrait on opposite page, the reader may note the undesirable flatness and loss of modeling which results from over-working the negative (here purposely done) and neglecting to strengthen the lights throughout the face before softening lines and shadows.

Portrait by S. H. Lifshey
(Unretouched)

If it springs back when the pressure is released it is a good one. If the point remains bent, reject the brush. These brushes are used to spot fine pinholes or transparent spots in the negative, and for placing broad touches of color in retouching the figure, where the pencil touch would be too hard and wiry. To properly charge a brush with color, wet it in water and then squeeze out the superfluous water by pressure against the side of the cup or glass. Now gently rotate the brush point over the color on the palette by rolling the brush handle between the thumb and fingers. In this way the brush is primed with color to the point and will do its work accurately and well.

Stomps, etc. The retoucher's stomps are made of non-fluffing blotting-paper tightly rolled to the thickness of a lead-pencil and bluntly pointed. A similar stomp of chamois leather will be found useful. They are used to spread the Conte crayon powder (black chalk) on the film (or glass side, prepared with ground-glass varnish) of the negative, when comparatively large portions of the picture image are seen to lack sufficient density. As an alternative to this powder, the Ingento black, blue and red pencils are sometimes preferable for working on the back of the negative. A bluntly pointed piece of soft india-rubber is used for removing excess of powder where this is needed. Some expert workers can work miracles in the way of modifying the printing densities of a negative by the use of crimson lake water-color on the glass side of the negative. This is done by dabbing the color on where needed with the ball of the middle finger. As the color gradually dries, this dabbing produces a graduated film of color, with a fine grain, over that portion of the image so treated. It is needless to remark that, where much of this broad treatment is employed, the negative must be printed under tissue paper and in the shade, so that the touches of brush or stomp will not be seen in the print, as will happen if a negative so treated is printed in the sunlight. The "reducing pencils," recently introduced, are very helpful conveniences in the after-treatment of the negative. They consist of pencil-like sticks of smooth, abrasive composition, and are sharpened and used just like a pencil, for the reduction of any portion of the negative where less density is desired, or for the removal or modifying of obtrusive lights on the head or figure of the subject.

Varnish or Medium

The gelatine film of the negative is too hard and smooth to offer sufficient tooth for much pencil work, so that the portions needing to be retouched are always coated with a varnish or medium which, when dry, gives just the right surface for the pencil. There are many good retouching varnishes on the market, and a twenty-five-cent bottle will suffice for a year's steady work. For myself, I use nothing more than a simple mixture made by dissolving a quarter of a teaspoonful of powdered resin in two ounces of turpentine, filtered when dissolved. If this get too thick, I add a little turpentine; if it is too thin, I leave the bottle uncorked until some of the turpentine has evaporated. What we need is such a varnish as, when lightly applied to the negative, will give us an imperceptibly thin film with a slight tooth, which will "take" the lead of the retouching pencil in any required amount. The medium is, of course, applied to the film side of the negative, and only over the face and head or other portions of the image to be retouched, by stretching a piece of soft cambric or silk over the tip of the middle finger, wetting this with a drop or two of the medium, and lightly going over the film with a circular motion, so as to get a very thin coating of varnish where needed, without streaks or thickened edges. A little practice will help the reader in this. Most retouching varnishes are very simply removed from a negative (or the fingers) by applying a soft rag wet with turpentine, which precious bit of information the beginner will need in his first attempts at retouching.

Knives

A set of tiny, very sharp knives, used for scraping or shaving or paring away the film in the removal of opaque spots, stray hairs, or altering the lines of the figure or reducing densities where desired, completes the retoucher's equipment. A set of these knives is described, with information as to their making, in THE PHOTO-MINIATURE, No. 116, but the Ingento Etching Knives or any other good commercial make will serve the purpose equally well. The beginner in retouching will do well to use the knife very sparingly until he knows just when and where and why. In skilled hands, as in surgery, the retoucher's knife will work wonders in the reduction of highlights, the shaving away of superfluous flesh under the chin, or where the neck spreads over the collar, or in reducing the width of the waist and so on. But this skill calls for a firm but delicate touch, and a very accurate knowledge of a lot of little things which the retoucher learns only in years of hard work with all kinds of subjects and negatives.

The Working Position

Much depends upon the working position in retouching. The desk should be firmly fixed to the table, with five or six inches of table room in front, so that the elbow can rest on the table. In such fine work as retouching, the drawing is almost entirely done by the movement of the thumb and fingers—that is, the wrist is rarely moved, the hand being usually supported by the inclined plane of the desk on which the negative rests. The retoucher should always sit upright at the desk, about twelve or fifteen inches away from the negative. Leaning forward is tiring and fatal to good work.

The Working Light

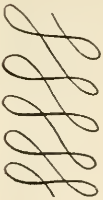
Care should be taken in the beginning to get the negative well illuminated. If the desk is set at a north window, and the negative screened from all light except that reflected through it from the mirror or white card at the back of the desk, it should be thoroughly well lighted for the work. A north light is preferable because of its evenness and diffusion. Do not attempt to retouch with the desk facing the sun.

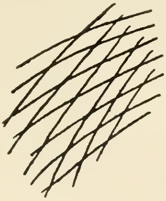
Repairing Negatives

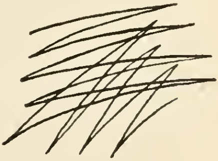
As a rule, the retoucher should prepare his negatives for work, that is, apply the medium to them, about half an hour before he begins to retouch. This allows the medium to dry and become sufficiently hard to work upon. Some mediums take a longer time than others to harden; on a damp day, especially, the medium is apt to remain "tacky" or sticky for an hour or two. A little dry heat will help matters. If the pencil cuts into the medium, or the point of the pencil becomes coated with the medium as one works, this indicates that the medium is not sufficiently dry and hard for working upon, and good work will be impossible. Put the negative aside until the varnished surface is just right for the pencil. On the other hand, if the medium has become too hard, it will not take the lead so responsively as it does when in the right condition. This is a detail wherein only experience can help. The worker will quickly learn just how to handle his medium so as to get the best working surface in a reasonable time, and will prepare his negatives so that he can be sure of this condition when he is ready to retouch.

The Touch or Stroke

In most books about retouching there is a good deal said about the different kinds of touches or pencil-strokes to be employed. Some workers advise a fine stipple, others comma-shaped strokes, hatching, circular strokes, dots, and so on. The plain fact is that any sort of stroke that will give the effect desired is the right stroke to use. It is a good plan to practise this "touching" with a pencil on white paper until one gets a clear idea of the meaning of it all. For example; Cut a small piece of an even gray tint from any half-tone engraving, and reproduce it exactly as possible with your pencil on the white paper. Practice of this sort, with varying degrees of tint, will quickly give the reader a good idea of the sorts of strokes or touches used in retouching. Better still, prepare with medium a few waste negatives which







have portions of uneven density in their backgrounds, and practise all manner of small strokes or touches in evening up the less dense portions until they exactly match the more dense parts. The few strokes here illustrated are given to satisfy the reader who must see things. They are grossly exaggerated in size, but will serve to show what touch means. In the average cabinet portrait negative the actual touches will rarely exceed a sixteenth or an eighth of an inch in length, and will run in every possible direction, crossing each other, the whole aim of the retoucher being to add density without showing the separate pencil touches. After a while the worker will find that he has acquired a touch which gives a softly defined grain on the negative; but the less this is apparent in the print the better, except in the case of life-size portraits, where the right sort of a "pearly grain" or stipple is sometimes thought to be desirable as giving texture to the face: The reader who has passed through the modeling-in-crayon class at an art school will realize at once what is wanted and how to get the desired effect.

Sizing up a Negative

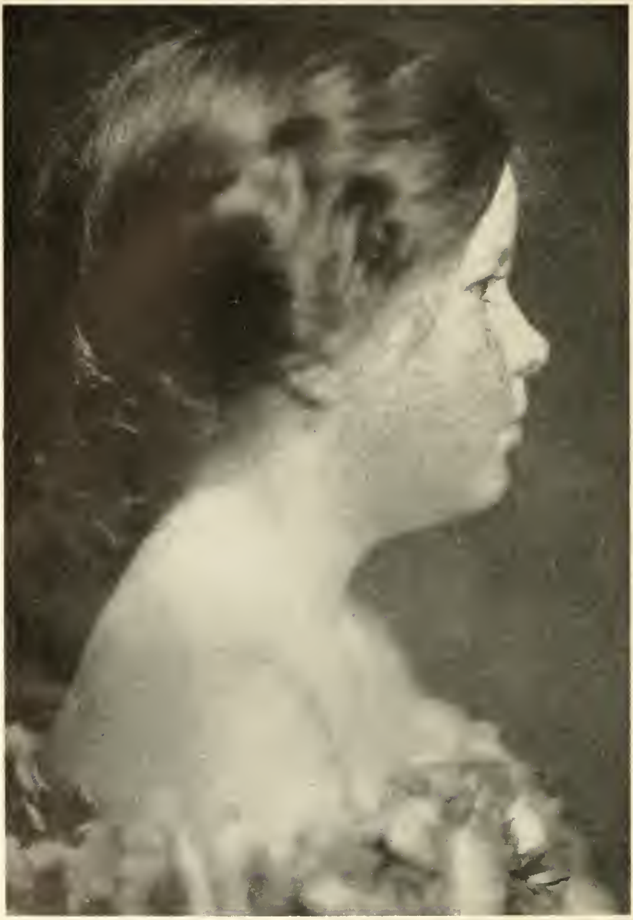
Now, after these preliminaries, we can take up the study of the negative on the desk, "sizing up a negative," as it is called. Place the negative on the inclined frame in position as described, covering it with the paper mask, so that only the head and face are seen, and sit correctly so as to view the negative slightly from above it. Adjust the hood of the desk so that the eyes are shielded from all light except that coming through the negative, which will be brilliantly illuminated by the window light reflected through it by the mirror or reflector in the base of the desk. As the eyes get accustomed to the quiet light under the hood, we begin to see the face of our subject in a manner altogether new. The modeling of the face and head is the chief point of our study now. We must remember that we are looking at a negative; i. e., that the transparent and semi-transparent portions of the film represent the shadows and halftones in the face of the subject, and that the opacities or densities in the negative represent the lights of the face.

The Modeling of the Face

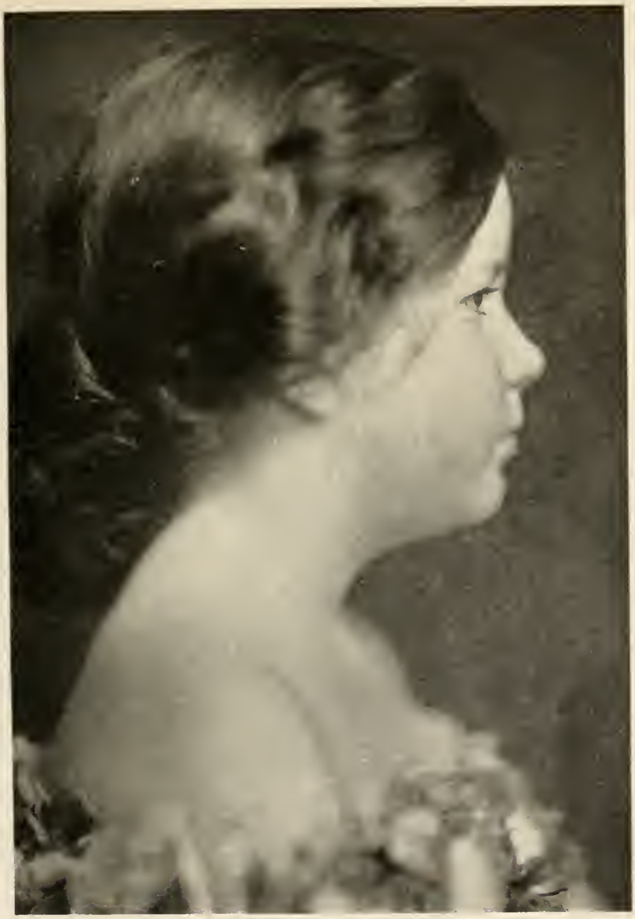
It is this infinitely varied graduation of lights and shadows, resulting from the irregularity of the features and the different curves of their surfaces, which makes up what we term the modeling of a face. All these relative light and shade values must be carefully retained throughout the retouching, however much we may modify exaggerations and remedy defects, since the personality and character of the subject are expressed in just these trifling irregularities of feature. A good portrait is one in which the natural modeling of the face and head of the subject is reproduced in its most favorable aspect. This is accomplished, "for better or worse," by the lighting of the subject when the negative is made. The clever retoucher retains this natural modeling, while removing the defects and exaggerations due to the photographic process, and supplies, so far as is possible or desirable, such "finishing touches" or subtle flatteries as will tend to make the finished portrait more pleasing to the person photographed and those for whom it was made.

A Typical Lighting

To return to our negative. It shows a typical pose of the head with the three-quarter lighting commonly employed as giving the most favorable view of the average person. One side of the face is more or less brilliantly lighted, the other side being in half shadow. The light falls upon the head and face from above, slightly in front and from one side of the subject. If the lighting has been well handled, the head and face will stand out round and in pleasing relief, the features will have their natural projection or recession, and there will be a soft shadow all around the edges of the face. There is a strong light, or highlight as it is called, on the brow or temple nearest the light source, well-marked lights over each eyebrow, a line of light down the near side of the ridge of the nose, usually terminating in a broader patch of light at the tip, and lights on the cheek bone at the outer corner of the eye, on the upper or lower lip, and on the tip of the chin. The prominence of these lights varies, of course, in different negatives according to the varied projection of the features in different faces



Unretouched Portrait of a Young Girl
By S. H. Lifshey



Portrait of a Young Girl

By S. H. Lifshey

Compare this with the portrait on the opposite page and note the changes or types of faces. A certain amount of light falls on the shaded side of the face, so that the modeling of the features on that side is plainly observable, but the highest light on that side of the face is usually darker than any part of the other, directly lighted side. These lights give us the key to the modeling of the face under this three-quarter scheme of lighting; and their relative values, in comparison with the rest of the face, must be carefully preserved.

The First Lesson

Now, presuming the reader to have a little familiarity with the method of placing his touch or stroke, we are ready to begin our first practise lesson. We will commence by strengthening the lights through the face, so that the modeling will be more plainly apparent.

Forehead

Beginning with the forehead, we note the position and shape of the highlights already mentioned. We see, too, that from the center, above the root of the nose, the forehead is a succession of curves. Curves everywhere—upward and backward toward the top of the head, and from the center to the sides of the head. These curved surfaces, with the delicate shadows where the hair touches the forehead, must not be smoothed out into a flat uninteresting plane, but should be jealously retained. There are lines and marks of age or thought or worry also. These, with the depressions of the forehead, are sometimes exaggerated in the negative, and will usually require softening or almost removing, according to the character of the subject. In women under fifty they should generally be removed almost completely. In men they are generally merely softened, as often expressing character and individuality. There are two sets of wrinkles: those running from side to side of the forehead, and those running upward from the root of the nose. They are always exaggerated in force in the negative. Those running across the forehead should be softened or removed; the vertical wrinkles should always be modified, but should rarely be wholly removed.

With these points in mind, we take the pencil and, with a series of light touches, remove any blemishes from the highlight on the temple. Note carefully that this light is usually divided by a depression in the bone at this part. Do not therefore make a general mass of density over the whole of the light, but keep the form of the temple depression by preserving this slight division in the densities of the highlight. The rule in this, as in the treatment of all other lights on the face, is to put the highest point of light, i. e., the point of greatest density, at or near the center of the highlight. A few careful touches will usually suffice to bring this light into definite form and give it the desirable evenness of texture with soft gradation.

Eyebrows

The lights over the eyebrows are not equal in value, nor should they be, and the stronger of the two will be less dense than the highlight on the upper brow already dealt with. Do not attempt to spread or enlarge the area of these lights. Pass quietly over them with the pencil, removing the obvious blemishes, slightly strengthening them as any minute depressions are filled, and giving them force by very slightly emphasizing the central portions of each light. Now, very gently, work from the center of each, with light touches, so that they will graduate or blend into the nearest half-tone or shadow.

Wrinkles and Lines

The softening of the lines or wrinkles will demand a firmer touch or stroke. Turn the negative so that the lower part of the wrinkle is from you. With each stroke of the pencil lift the point as it reaches the darker edge. When the transparent hollow forming the wrinkle has thus been partly filled, blend the lighter and darker portions by fine touches until the wrinkle is as soft or unobtrusive as you desire it. A little practice will bring the desirable facility. The wrinkles being removed or softened, we now take a good look at the forehead as a whole, sitting well away from the negative, and by a few well-placed strokes of the pencil gather all the different lights, half-lights and delicate shadow masses together, so that the forehead is even in texture, i. e. without alternating rough and smooth patches, with all its natural, characteristic form intact.

The Eyes The eyes are the most difficult portions of the face in retouching. Perhaps, at first, the reader will do well to leave them untouched, unless it be to merely soften the heavy shadows at the corners and underneath the eye. For example: if the shadow beneath runs far into the cheek, this may well be shortened, and the rest of the shadow softened and blended up to the slight ridge at the lower part of the socket. Where there is a sac or fulness under the eyes, naturally catching more or less light, be careful not to touch this with the pencil and so accentuate it. By softening the wrinkles here, and around the corners of the eyes, the unsightliness of the sac can oftentimes be apparently reduced. What are commonly known as "crows' feet," at the outer corners of the eyes and sometimes at the inner corners extending to the sides of the nose, should always be softened, and, in the case of women generally removed or almost removed. This will require careful, well-directed pencil strokes, so that the natural shadows at these points are not obliterated. Almost always there will be a very slight shadow cast by the eyelashes over the eye itself. This should be left untouched. When the retoucher is sufficiently acquainted with his manipulation, the form or shape of the eyebrows may be very carefully worked towards the ideal arch; but this should not be attempted by the beginner, who should content himself with the careful removal of the most obvious blemishes and malformations of these features.

The Nose We now come to the nose, next to the eyes the most characteristic feature of the face. Holding the negative straight, we note a line of light, in some places broader than at others and generally varying in density, running from the bridge a little more than half the length of the nose, and often ending in a decided light at the tip. Observe the shape of the nose carefully before touching it. Remember that the bone extends only halfway down the length of the nose, after which comes the cartilaginous portion ending in the tip and nostrils. There should be a break in the line of light at this point. Remember also that the space between the line of light along the ridge and the other edge against the shaded side of the cheek determines the width of nose. Save in exceptional cases, therefore, be careful not to broaden the light. Between the eyebrows and the eyes, where the nose is lowest and narrowest, the shadow should be kept, only pronounced furrows or wrinkles being softened. Now gently connect the broken line of light from the bridge to the tip with a few very light strokes, just sufficient to give it a barely visible continuity. Go back and touch any spots of lighter density along both sides of the line to give the ridge a softly rounded appearance. Blend any little uneven spots at the sides of the nose into their surrounding portions without losing the form of the shadows which are essential to the proper projection of the nose. Especially be careful not to remove the shadows around the wings or nostrils. The position of the high-light on the tip determines the length of the nose and calls for careful consideration. In thick, stubby noses the light will be higher up than on a nose of the long, straight type. By working the point of light slightly lower in the former and slightly higher in the latter, an improvement will generally be gained. If the nose is hooked, i. e., turns sharply down and in at the tip, the prominence of the hook can be modified, when desirable, by a few upward strokes on the highlight at the tip to carry it higher, and the very careful use of the reducer pencil to reduce the density at the very end of the nose under the tip. When the tip of the nose appears too wide and thick, this can sometimes be remedied by bringing the highlight nearer to the shaded side of the face. In all this work the reader should note that every touch tells, and that only the lightest and "littlest" strokes should be employed until the worker is fairly sure of the effect of each movement of his pencil.

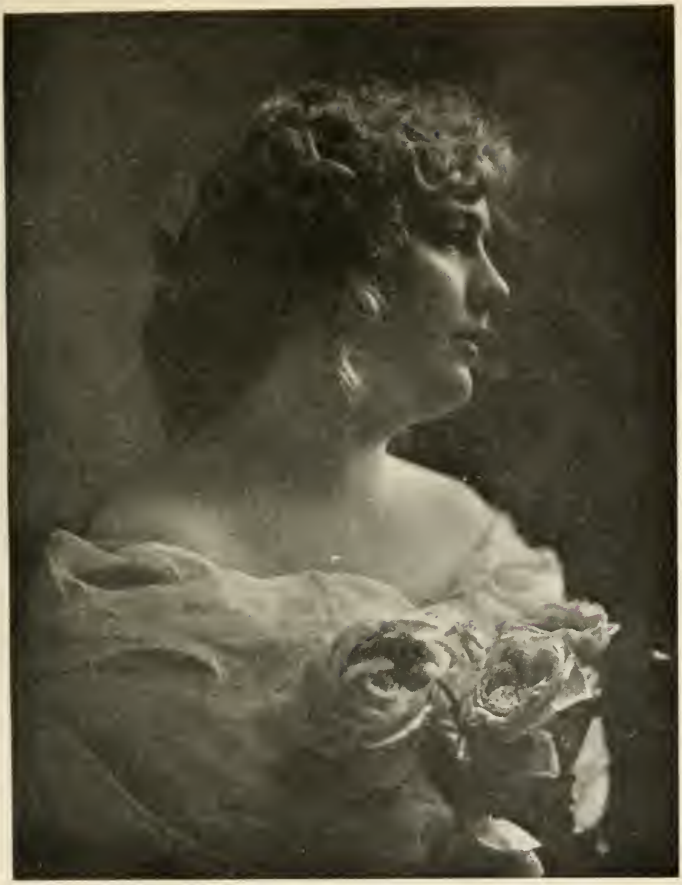
The Cheek

The highlight on the cheek bone may now be retouched by holding the negative sideways and gently touching any blemishes or depressions in it. Notice the shadow which runs up from the wing of the nose to the more pronounced shadow under the eye. The form of the cheek depends on the preservation of this shadow.

Very slightly strengthen the highlight on the cheek bone first, turn the negative obliquely and work down the cheek with light strokes toward the lower side of the face or jaw. Do not attempt to smooth or even up the whole of the cheek to an even density. Simply remove any spots or obvious blemishes, fill any pronounced depression, and work for a soft texture, keeping the natural form with plastic roundness. If the shape of the high-light is changed along its upper edge, this will infringe upon the shadow and markings under the eye, and, unless the cheek is properly graduated into the side of the nose, the appearance of the face will be decidedly changed. For this reason it is usual to retouch the eyes and nose before the cheek is dealt with, as helping to preserve the natural modeling of the cheek. Sometimes the cheek may be sunken or show a heavy shadow, due to ill health, age, loss of teeth or (in an otherwise plump, robust face) the red of a ruddy cheek. This depression, whatever its cause, should be softened or modified by a few light pencil touches, holding the negative obliquely and making the touches downward toward the chin. In the case of girls or young women, the shadow should be wholly removed, with care that the natural form of the cheek is not lost. On the cheeks we usually meet with the most pronounced freckles and markings. These should be removed altogether in the general finishing of the cheek, after the strengthening of the principal lights. Be careful not to put any unnecessary touches at the slight fulness of the cheek near the corners of the mouth. In faces where this fulness catches the light, its fulness can be modified by reducing the shadows at the corners of the mouth, and slightly emphasizing the light on the lip and tip of the chin.

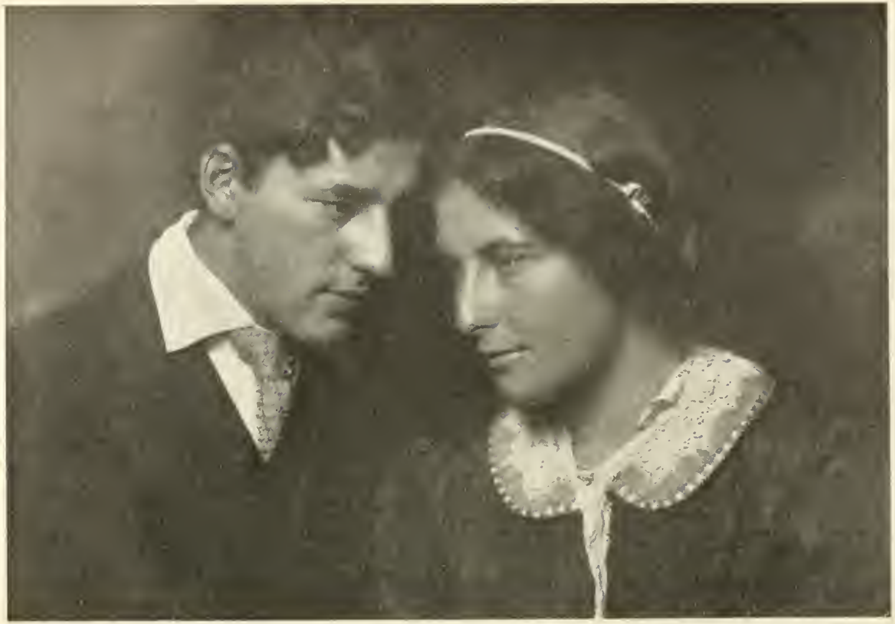
The Mouth

The mouth has much to do with the expression of character, but its natural shape is rarely secured in the negative because of the general tendency to hold the lips in some preconceived way when being photographed. On the upper lip we will find a shadow, more or less pronounced according to the lighting employed. This should never be removed and, if it must be softened,



Portrait by the late C. C. Kough

Note here the well-rounded modeling of the face, neck and shoulders, despite the contrasts of tone inevitable in profile lighting



Portrait Group, by Rudolph Dührkoop

The lights on the faces here are slightly forced, according to the German manner in retouching; but the modeling is well handled and the characteristics of the subjects are kept throughout.

care should be exercised not to change its shape. The vertical ridges of the hollow which runs down from the nose to the middle of the upper lip may need a little emphasis to keep the shape of this feature—especially on the shadow side of the face. Any inequalities of density between the nose and the line of the upper lip should, of course, be softened so that they will not show obtrusively in the print. The upper lip is always in shadow. If the line of light at the top of the lip, which gives it form, is irregular or broken, it may be softly shaped by a touch or two, just sufficient to suggest a definite form. In a beautiful mouth this line, with that of the lower lip, takes the form of "Cupid's bow," and, as a rule, all retouching of the lips looking to slight changes in the shape of the mouth are made so as to approach this form. Lines, cracks or similar imperfections in the lips themselves should be filled in, but only if they are so obvious that they will show in the print. Where it is possible, the surfaces of the lips should be left untouched. A good mouth may easily be utterly ruined by placing too broad a mass of light on the lower lip, in the attempt to smooth it. The corners of the mouth need very careful handling. In a smiling face the shadows at the corners of the mouth have an upward turn, and there will be a line or indication of shadow from the wing of the nose to the angles of the mouth. These shadows may need to be modified, but no attempt should be made to remove them, as is often done, with the idea of shortening the mouth and so making it appear smaller. If, on the other hand, the corner shadows of the mouth incline downward, they should be considerably softened so as to appear less heavy in the print. In some cases this softening may go as far as taking away a portion of the lower angles formed by the shadow, which will help to reduce the severity of the expression. Note that, no matter how the subject is lighted, there is rarely a decided black shadow between the lips. There are three degrees of shade in the lips. The upper lip casts a shadow on the inner part of the lower lip. Within this shadow the lower lip attains its darkest shade. Then there is a shadow on the lower lip cast by the projection of the aisle of the upper lip. This latter shadow is usually defined by two little highlights, one at either side. These may be strengthened a little to preserve the shape of the shadow between them. The heavy shadow under the lower lip, at its center, should not be touched unless it is obviously too dark and heavy, as it gives the mouth firmness and character.

The Chin

Before touching the chin, note carefully its shape and any characteristic irregularities. If it is dimpled at the center, first slightly strengthen the highlight (keeping it always lower than the lights on the brow and cheek), and then soften the shadow forming the dimple until it blends into the edge of the highlight. Be careful not to obliterate the delicate shadows running upward from the highlight on the chin to the lower lip, and downward to the lower edge of the chin, since these define the shape. Depressions at the side of the chin, between the highlight and the corners of the mouth are generally somewhat exaggerated in the negative. They may be softened carefully, but their form must be kept as essential to the proper expression of the mouth. At the point where the chin turns under to approach the neck there is often a line of reflected light from the chest or white collar. Leave this light untouched, and especially refrain from trying to connect it with the highlight of the chin. In dealing with a weak, receding chin, a little work with the pencil bringing the highlight down may help its appearance. On the other hand, where the chin is bold and prominent, simply touch the defects and blemishes and soften its contrasts by as little pencil work as possible. When the subject is a man with a stubby, unshaven chin, remove the clouded, irregular depressions so far as possible by little touches with the pencil held almost at right angles to the negative. This smoothing of an unshaven chin will be tedious work, but it can be done with patience, without loss of modeling. The retouching of a double chin is a still more difficult matter. Properly considered, this calls for knife work before the negative is prepared for retouching. In this the light on the lower or second chin is carefully reduced by scraping until its density corresponds with or gently blends with the density of the neck. After varnishing, the line of shadow which separated the upper and lower chins may be softened until it disappears, the lower chin being thus wiped out of existence. The same treatment is used where, for any reason, a part of the neck impinges on the collar.

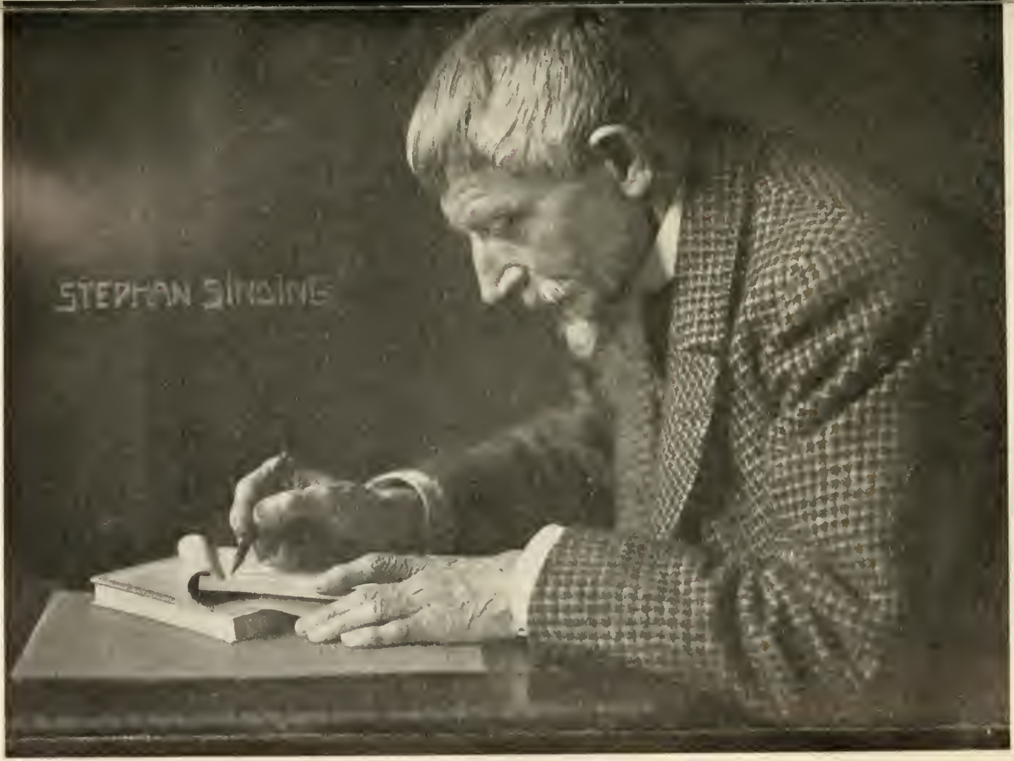
The Ear

In many portraits the ear is a source of difficulty, being either too large, or too broad, or too prominently lighted. Sometimes it may with advantage be reduced in tone by rubbing the film of the negative, before varnishing for retouching, with a tiny tuft of absorbent cotton on the end of a match-stick wetted with alcohol. This local reduction is effected with light circular motion and very slight pressure, until the density is seen to be slightly reduced. Ears which are too large and misshapen may at times be helped by judicious shaving with the knife. Before attempting this, however, the worker should be thoroughly familiar with the shape and structure of an ideal ear, or he is likely to do more harm than good. Where the projections and depressions of the ear are unsightly in shape, these may be helped by very slightly strengthening the perpendicular lines of light and softening the shadows which give shape to the depressions. Generally speaking the less pencil work we put on the ear the better, so that in many cases it will be advisable to confine the work to the removal of blemishes and the softening of the vertical shadow or wrinkle generally found between the ear and the cheek.

Neck and Bust

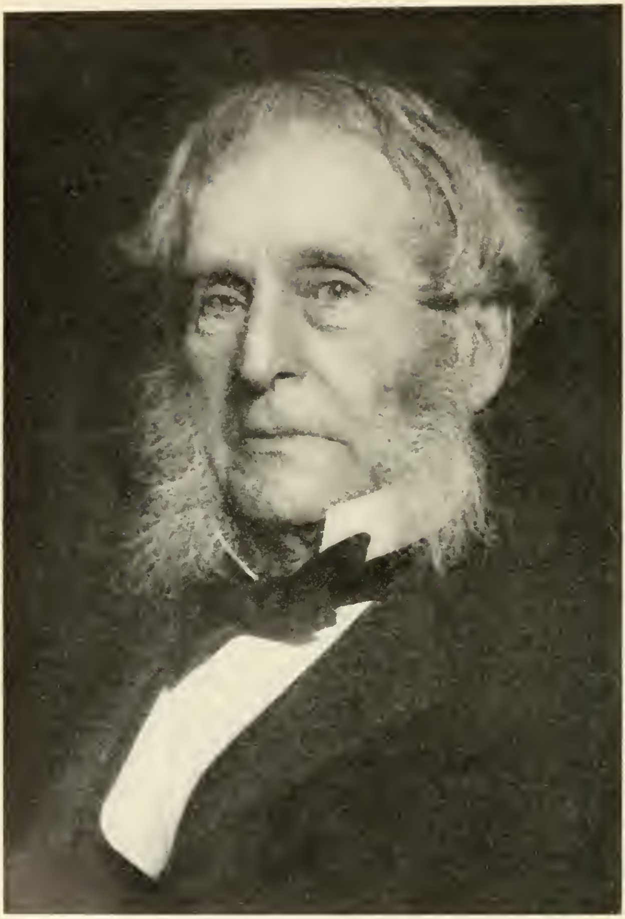
The neck and bust now call for attention. In portraits of men only the neck and throat are shown, always in much lower tone than the face. Generally a few bold and decisive strokes will be sufficient to remove the blemishes and irregularities of modeling. The shadows where the neck approaches the chin or touches the collar should be carefully preserved, and the roundness of the neck kept by leaving the shadows at either side untouched. Ugly lines running across and down the neck, furrows or ridges such as seen in the necks of those who live the strenuous life, should always be very much softened. If the "Adam's apple" casts an apparent shadow, this should be softened and blended into the surrounding portions of the neck. Where the high-light on the "apple" is too prominent, this should be reduced with the knife before the negative is prepared for retouching. Any heavy shadows caused by the projection of the muscles should be filled in or very much softened by bold strokes sloping to the center of the neck.

If the portrait be one of a woman in a low-cut dress, with the neck and shoulders exposed, a good deal of work may be called for. A coarser stroke may be used here than on the face, working across the neck in curved lines parallel with the lines of the jaw. All the muscles, such as the large one leading from the ear to the collar-bone, should be almost completely removed except that an indication of its perpendicular character is left, as in the profile portrait by Mr. Kough among our illustrations. Where there are heavy shadows, caused by the prominence of the bones in a flat or thin chest, the highlights on these bones should be carefully lowered in tone with the knife (before retouching), and the near-by shadows brought up with the pencil until a desirable roundness is secured. Any decided shadows resulting from the division of the breast bone should also be removed. The strokes now (on the bust) should be made at an angle of about 45° with the perpendicular of the body, never vertical. The shadows between the base of the neck and the shoulders, extending down under the arms, may be softened, but should always be retained, although softened and blended so as to give general fullness and roundness to the surfaces of the neck and bust. In some subjects inclining to plumpness the shadow between the breasts will be pronounced, and more often than not in professional portraits this is further emphasized by pencil work at each side of the shadow, producing a vulgarly gruesome effect. Properly the shadow should be softened so that the bust will appear neither flat nor swollen, its naturally beautiful curves being presented by a pleasing balance of light and shade values.



Portrait, by Rudolph Dührkoop

Here the character of the subject is cleverly kept by softening, but retaining, the lines and texture of the face and hands



The Hon. John Bigelow, by W. M. Hollinger
An unretouched portrait, reproduced from a rough platinum print

Hands and Arms

Usually the hands and arms in a portrait are hidden, or, if shown, are portrayed without much fineness of delineation or modeling. It is a pity that this is so, since they so often add to the character or attractiveness of a person in life. When displayed, as in portraits of women in evening dress, the arms can be acceptably rounded, and given a smooth, finely-grained texture, by employing an easy, scumbling curved stroke, at an angle of about 30° with the direction of the arm, the same direction of stroke being kept from the shoulder to the wrist. If the arm is weak and thin, broaden the light toward the center, which will give it fullness. An elbow too angular or hard in character may be given a more desirable shape with the knife, but care should be taken to retain the shadow of the hollow at the elbow. Strongly marked veins or bones in the wrist, hands or arms, should always be very much softened or removed entirely. If the worker will first familiarize himself with the details of well-formed or beautiful hands, by a study of the plates of good hands obtainable in artists' supply stores, he will find that a few well-placed strokes of his pencil in the negative will enable him to add largely to the attractiveness of the hands and arms of his subjects. In some subjects, as in the portrait of Sinding, by Duhrkoop, the character of the person is better expressed by leaving the hands untouched; but this means that the photographer must see and make the best of the subject under the skylight. Where the hands are large and prominent, it will often be necessary or desirable to reduce them in tone by rubbing with alcohol, as previously suggested, before preparing the negative for retouching. The face is the chief point of interest in the portrait, and the hands should always be subordinated in tone.

The Hair

It is sometimes necessary to retouch the hair in a portrait, owing to the subject having moved slightly during the exposure, or the hair being too dark and without form, or out of focus. First note that this should never be done with fine pencil strokes running in the same direction as the hair itself. This gives a hard wiry effect, and apparent grayness. The light should be added in short, broad strokes, placed in patches, running across the natural direction of the hair. The strokes of the pencil will, of course, be in the direction of the growth of the hair, but the light patches so formed should run across the hair. If it is desired to lighten the hair generally, this can be done by using the stomp and black chalk on the film of the negative, or by applying matt varnish to the glass side of the negative and working on that with the stomp or with brush and crimson-lake water-color, emphasizing the form as may be desirable. By the judicious use of pencil, stomp and brush much may be done to improve the rendering of the hair, when a little practice has given the worker the ability to judge of the effects secured by the different mediums available for this purpose.

Other Lightings

In the foregoing pages we have considered in detail the handling of the three-quarter lighting of the head and face, that being the method of lighting most generally employed in portraiture. When the reader comes to other methods of lighting the face, such as full or almost full front lighting, as in the portrait of a young girl, by Lifshey, among our illustrations; or profile lighting, as in the portrait by Kough, the method of working will need to be modified somewhat, although the general principles of treatment remain unchanged. Study carefully the modeling of the face under the method of lighting adopted in making the portrait in hand. Then go over the face as a whole, beginning with the forehead, simply removing the more obvious blemishes and strengthening the highlights, before attempting much work on the separate features. And remember, at all times, that your object is to do all that the negative may require, or that is possible for its improvement, with as little work as is possible. Very often a negative will be so smooth and so beautifully modeled by careful lighting that it will require only a few touches here and there—only a few minutes' work. To see this, to appreciate how little pencil work a negative really needs, is worth even more than knowing how to do things which a negative does not need.

Full-face Portraits

Faces which are turned full toward us and lighted from above, although seemingly simple in lighting, are often difficult in retouching. This is because such a lighting gives either violent contrasts, with broad patches of light and heavy shadows, or a soft, flat modeling, with a puffy appearance and weak shadows. In the first case, do not touch the highlights except to remove any blemishes which will show in the print. Then fill the heavier shadows to soften and blend them as far as possible into the lights. Be careful to retain all the shadows at the sides of the face, around the forehead, temples and cheeks, so as to give roundness to the face. Try to keep a line of shadow at the lower side of the jaws while softening the heaviness of the shadows under the chin. Reduce the shade on the upper lip and very considerably soften the exaggerated lines and wrinkles. Then, after doing what can be done with the pencil on the film, coat the glass side of the negative with matt varnish, and soften the harsh contrasts further by a careful use of the stomp and black chalk. Such a negative should be printed in a quiet light under one or more thicknesses of tissue to obviate the unusual amount of pencil and stomp work showing in the print. In the case of a full-face, flat lighting we must remember that every touch of the pencil will tend to further flatten the weak modeling of the face. Here, after lightly touching the blemishes through the face, the lights should be strengthened, all the shadows being left untouched as far as this may be. Especially should the delicate shadows around the face be carefully preserved, and those under the eyebrows and down the sides of the nose.

Profile Lighting

When the head is so lightened that the profile receives the strongest lights, the greater part of the face being in shadow and the bust being fully illuminated, as in the portrait by Kough, among our illustrations, the principal care is to get roundness in the shadow side of the face without running the cheek and jaw into the neck. First remove the blemishes and fill in any very harsh shadows on the temple, at the side of the nostril, under the corner of the mouth; then with a few light irregular strokes running crosswise put a little transparency into the shadow on the cheek. Now carefully blend the highlights into the halftones near them, and the modeling of the face will stand out in soft relief with the light on the profile as emphasis. In retouching the neck and bust fill the heavy shadows of the muscles, which will generally be prominently marked by the turn of the head, and then work for softness and roundness, without emphasizing the lights at the edge of the shoulder and on the breast bones, and without softening or removing the shadow along the shoulder away from the light source. In profile portraits it is often necessary to lighten the hair. Do this by working along the lines already advised, with broad touches across the line of light. Note the clever touches of light on the curl of hair on the cheek in the portrait by Kough, which gives desirable relief to the cheek by its opposition to the shadow mass there.

Using the Knife and Stomps

Apart from the head and face, there are few portrait negatives which do not need the retoucher's help in the details of the dress, background or accessories. Here broadness of effect is desirable rather than fineness of detail, so that the work calls for a blunt, chisel-pointed pencil, or the stomp and black chalk on the matt-varnished, glass side of the negative, or the use of brush and color work. The touch employed with these media should be sure and broad, fineness, hardness or wire-like strokes being fatal to the effect required. In some cases the retouching knife will be more useful than any other tool. For example: Where any prominent detail in the background or accessories cuts awkwardly into the lines of the head or figure; if this is a line or mass of shadow, it should be softened or almost removed with the pencil or stomp; if, on the other hand, it is a line or patch of density (representing a light in the print) then the knife should be used to shave or pare or scrape it down until it blends into the picture so as not to catch the eye.

Dress and Draperies

In a woman's dress there will often be unsightly lines which displease a critical eye, giving the suggestion of ill-fitting clothes. Such lines can usually be wholly removed with a few vigorous strokes of the blunt pencil, so that they will not show in the print. Where the light catches these undesirable lines of course the knife must replace the pencil. Remember that all knife work must be done on the unvarnished film before the negative is retouched, so that any little defects resulting from the use of the knife can be remedied by the pencil, such as softening and blending. Also it is much easier to use the knife on the film before it has been varnished or made greasy by handling. A surgeon's scalpel makes a handy retoucher's knife, the point and the curve near the point being used. The point should be without appreciable thickness, and frequent honing will be necessary to keep the tiny cutting edge to the required sharpness. In some cases, as in giving a better outline to the figure, the knife is used with a shaving or planing stroke, working from outside the edge of the figure inward. When the dress is lighter than the figure, any alteration of the shape is done with the pencil, taking care in both cases to keep the outline soft, so that the figure does not seem to be pasted onto the background.

Those portions of the draperies which need slight emphasis, such as the figure in laces or embroideries, are best worked with the brush and watercolor, a soft, flowing stroke being used to prevent the work giving stiffness to the drapery. The larger folds of drapery can often be given life and interest by the skilful use of the stomp and black chalk on the film side of the negative, the pointed rubber being used afterward to remove all excess of lead.

Removing Backgrounds

When it is desired to remove the whole of a background in a portrait negative, as in the case of a portrait copied from a group, proceed as follows: Varnish the whole of the film side of the negative with matt varnish. When thoroughly dry, take a fine pointed chamois stomp and apply black chalk around the outline of the figure. Now carefully blend and soften the inner side of the chalk line (nearest the figure) into the outline of the figure. This should give a narrow band, one-quarter of an inch wide, of complete density around the figure, blending into the figure so softly that there will be no harsh line there. Now with a brush charged with liquid opaque, cover the balance of the negative, so that the background is completely obliterated, so that no details are visible. This will give a portrait with a clear white background. To secure a print of such a subject showing a plain tint for the background, proceed as follows: Take a plain print from the portrait negative which has been blocked out. Cut the figure from this print, slightly within the outlines of the figure. Now paste this cut-out figure onto a piece of matt celluloid of the same size as the original negative. Place this celluloid dummy in the printing frame with a piece of the printing paper, and print just deep enough to get a decided tint on the sensitive paper. Remove this from the frame and carefully adjust the original, blocked-out negative on the paper so that the figure just comes within the unprinted portion of the paper. Now put out to print again, and print until the portrait reaches the desired depth. If this combining be skilfully done, the portrait will appear with a pleasing tint background, without any harsh lines visible between the figure and the surrounding ground. Or the shape of the figure can be painted on the celluloid dummy with the liquid opaque.

A Last Word

The use of the knife, stomps and water colors, as well as the removal of backgrounds, fall within the province of the advanced worker rather than the beginner. Their successful use, of course, depends upon careful experiment and patient practice. But it is desirable that the beginner should, from the beginning of his work, acquaint himself with these tools, and, by constant endeavor, learn how to make them give him the effects described. At first their use should be confined to the removal or remedying of the little, minor defects in negatives. As skill comes, the more ambitious things can be attempted. This sort of manipulation cannot be taught by the printed page, but sufficient has been said to indicate the first steps, and the reader who will work along the lines here mentioned will find his skill increase with every intelligent endeavor.

Negatives and the Retoucher A brief consideration of portrait negatives from the retoucher's point of view will probably be helpful to the beginner in retouching. In the first place, since every touch of the pencil is intended to effect a change in the density of the negative at the point touched, it is plain that the more closely the color of the negative matches the color of the lead-pencil, so much the more certain will the retoucher be of the precise effect of his retouching in the print. Thus the color of a negative developed with pyro-soda containing a generous proportion of sulphite of soda is more favorable for retouching than a very yellow negative, such as some developing formulæ give. For the same reason, a thin negative which has been reddened or yellowed by the action of an intensifier will, by its color alone, present practical difficulties in retouching. In such a case the use of a softer, and therefore blacker, lead than usual will be necessary, with possibly the use of a little color applied to the glass side of the negative as a further help in softening the deeper shadows of the hair.

Color Sensitive Plates As a general thing, the use of ortho- or isochromatic plates is advised in portraiture as a practical way of minimizing the amount of retouching required. When possible, the use of the kind known as panchromatic plates is preferable, this kind being generally color-sensitive, and therefore giving a more harmonious rendering of the various shades of color found in the average subject. Especially are panchromatic plates advantageous in making portraits of people whose faces are tanned, freckled or otherwise discolored by exposure to sun and outdoor conditions generally. I recall the practice of a prominent professional of this city who, when called upon to photograph a subject of this character, employs not only orthocromatic plates, but also filters the light reaching the face through a screen of very light yellow silk, held in the hand during the exposure, so as to modify the light falling on the face of the subject. The device is well worthy of a practical trial. In using orthochromatic plates for this special purpose in portraiture, it is important to give a full exposure and to be careful not to push development too far. An under-exposed orthochromatic plate, strongly developed, gives harder and harsher negatives than the ordinary plate under the same conditions. It should, however, be noted by those who make their own portrait negatives, as well as retouch them, that a fully exposed and softly developed negative is easier to retouch, and will need far less retouching, than one which has been ever so slightly under-exposed and over-developed. This is one reason why professional portrait negatives are so much easier to retouch than portrait negatives made by amateurs, being generally more fully exposed and developed for softness and detail without excessive density.

Focusing

Another negative pointer which tends to reduce the amount of retouching required concerns the detail of focusing. Most amateurs' portrait negatives are sharply focused. This, in portraying the face, results in the exaggeration of the lines, freckles, and every other sort of facial defect to a discouraging degree, and means a lot of unnecessary work in retouching. The right way to overcome or obviate this is to focus sharply on the eyes of the subject, and then open up the lens, i.e. use a larger diaphragm, and so secure a pleasing diffusion of definition throughout the different planes of the head and face, which will give a desirable softness of modeling in the print. Of course, care should be taken in the use of of this diffusing device, to avoid woolliness and coarseness of detail. A little practice and observation will enable the reader to recognize and secure the right degree of softness with ease, once the point is properly appreciated. It should not be forgotten that there are now obtainable, at very reasonable prices, lenses designed to give any desired degree of diffusion in portraiture. Skilfully used, these special lenses are peculiarly advantageous in home portraiture.

Reduction and Intensification

A very much under-exposed negative is rarely worth retouching. Where, however, the reader has to deal with a negative of this sort which cannot be replaced, he should proceed as follows: Examine the negative carefully to see whether it cannot be improved by intensification or reduction before retouching. I am well aware of the fact that this sort of negative is unsuited to these methods, which are chiefly useful in remedying faults in development rather than errors in exposure. But sometimes they do offer a way of helping even a a badly under-exposed plate. For example: if the under-exposed plate, by forced development, is harsh in its contrasts, with dense lights and transparent shadows. Here the use of persulphate of ammonia reducer will materially soften and modify the contrasts by reducing the heavy density of the lights. In the case of an under-exposed and under-developed negative, slight intensification with the old reliable Howard Farmer intensifier will bring up the weak detail and give the retoucher a better working basis. Formulæ and working methods for these two sorts of negatives may be found in THE PHOTO-MINIATURE, No. 116: *Hand Work on Negatives*, a little handbook which should be on the work-table of every retoucher. When the negative has been helped as far as possible by these methods, it should be carefully retouched with a light rather than a heavy touch. Finally the glass side of the negative should be coated with a fine-grained matt varnish, upon which further work may be done with a paper stomp and powder lead, or black crayon powder, or washes of sepia color, until the desired improvement is secured. Frequent proofing at all stages of the work is the only sure way of learning the precise effectiveness of the work done. Such a negative should always be printed in the shade, or in a quiet diffused light, the use of a moderately rough-surfaced paper, such as platinum, being indicated. If a gaslight paper is employed, expose the negative behind tissue paper.

Notes and Comment

The February number of THE PHOTO-MINIATURE, which will reach my readers before the end of the month, will deal in a very simple but comprehensive way with *Enlarging on Development Papers*. The world-wide popularity of "gaslight," or development papers, for contact printing has brought me an ever-increasing volume of correspondence, requesting reliable methods for making enlargements on these papers. Unfortunately, the manufacturers of this class of papers either have not yet realized their possibilities along this line, or do not care to encourage their use for enlarging. At any rate, I could get very little of encouragement or information from this source, in spite of persistent requests. At last an enthuastic amateur, Mr. James Thomson, of Dorchester, Mass., came to my aid with a satisfying monograph on the subject, detailing his methods, and giving reliable formulas for obtaining enlargements on these papers, based on two or three years of experience in their use. The account he gives is written for the amateur who seeks simplicity of working method, combined with certainty of results, and will, I am sure, serve as a standard first book on this subject.

Many of my readers will hear with great regret of the death of Mr. L. F. Hammer, Jr., of St. Louis, Mo., whose long connection with photography made him a familiar figure at the photographic conventions of the past twenty years. He was a man of unusual personality, amiable, full of life and fun, a clear thinker and an eloquent speaker, diligent in his business, and ever ready to lend a helping hand to his co-workers in photography. With all who knew him, I extend my sincere sympathy to his father, Mr. L. F. Hammer, Sr., and the family, in their great loss.

Despite the dullness of trade in photographic circles during the past year, of which there were many complaints, I cannot recall a time when the journals of the craft were as interesting, or as crowded with evidences of photographic activity, as they are just now. Those who would see this for themselves should invest eleven cents in post-cards, and write to the following papers requesting the favor of a specimen copy. *Photo Era*, Boston; *American Photography*, Boston; *Popular Photography*, Boston, *The Camera*, Philadelphia; *Bulletin of Photography*, Philadelphia; *Abel's Amateur Photographer's Weekly*, Cleveland; *Abel's Photographic Weekly* (professional), Cleveland; *Camera Craft*, San Francisco; Ackerman's *Photographic News*, New York; *The Photographic Times*, New York; and *Wilson's Photographic Magazine*, New York. Mention this personal recommendation in each instance, or the post-card may not work.

Photograms of the Year 1912, edited by Mr. F. J. Mortimer, began a new series of this splendid annual review of the progress of pictorial photography, founded, as my readers will remember, by the late H. Snowden Ward. The volume was enlarged to twice the size of former issues, which permitted larger and more satisfactory reproductions of the pictures selected to represent the pictorial output of the year. The American edition completely sold out quickly after its arrival, but it is possible that a few dealers may still be able to supply orders.

Penrose's Pictorial Annual for 1912–1913, familiarly known as "The Process Year-Book," is now ready for delivery, Although primarily published for workers in reproduction methods, this beautiful year-book, with its seventy odd papers on photographic and process subjects, and almost five hundred illustrations, many of them full-page supplements in three and four colors, photogravures, etc., abounds in interest and inspiration for all concerned in the illustrative arts. The price is $3, express prepaid.

I suppose that most amateurs have experienced the difficulties peculiar to photographing home interiors where very small rooms are concerned. The following hint sent me by an expert in this work is worth noting. He says: "Recently I had some interiors to make in very small rooms, and had to set the camera back in the doorway, so that a flashlight was out of the question. In its place I used two 250-watt tungsten lamps, elevated on a stand so as to illuminate the room brilliantly. With this I gave an exposure of three minutes at *f*/18, using a Cramer instantaneous isochromatic non-halation plate. The result was everything I could have wished for, and I shall use this device in much of my home interior work hereafter."

Some weeks ago I had the pleasure of a chat with Mr. Alvin Langdon Coburn, who was passing through the city on his way to London. Among other things, I learned of his recent marriage to Miss Edith Wightman, an event which, following a friendship of many years, is bound to add to their and the world's happiness.

While in New York, Mr. Coburn took a leading part in the management of an exhibition illustrating "The Progress of the Art of Photography in America," at the Montross Art Galleries, New York, October 10 to 31. This exhibition was arranged to give the public an opportunity to see the later work that has been done in American pictorial photography, and also to give those who exhibited an opportunity to see their work properly hung with that of others, for a comparative judgment of its merits. The exhibition was at once most satisfying and encouraging to anyone interested in the progress of pictorial photography in this country. It comprised about one hundred and fifty pictures, selected from work submitted by Paul L. Anderson, Charles H. Barnard, Jeanne E. Bennett, Albert Bolenbaugh, Francesca Bostwick, Katherine Stanbery Burgess, Victor N. Camp, Sidney Carter, A. D. Chapman, Alvin Langdon Coburn, Dwight A. Davis, Charles B. Denny, Edward R. Dickson, William B. Dyer, Dr. Arnold Genthe, Louise Halsey, Gertrude Kasebier, Spencer Kellogg, Jr., William E. Macnaughtan, H. H. Moore, William J. Mullins, W. H. Porterfield, Mary E. Robinson, A. Romano, Eva Watson Schutze, George H. Seeley, Eleanor Pitman Smith, Ema Spencer, Karl Struss, Augustus Thibaudeau, Edith H. Tracy, Clarence H. White, Amy P. Whittemore, and Edith R. Wilson.

The catalogue had a pleasing foreword by Temple Scott, and the arrangement and decoration of the galleries by Max Weber deserves a word of appreciation.

During the holiday season just passed, many of my readers doubtless received seasonable greetings in the shape of tinted photographs, and will recall how much the touch of color added to the attractiveness of the pictures. The tinting of photographs is now a very simple matter, well within the skill of even the most inexpert because of the variety of transparent colors now obtainable, and the simplicity of their use. The Velox Transparent Water Color Stamps, obtainable from most dealers, offer a practical and inexpensive equipment for this work, and may be used for coloring Velox prints, bromide enlargements, lantern slides and halftone engravings with equal facility. These stamps come in a booklet, consisting of twelve colors arranged in perforated leaflets, making twenty-four stamps of each color, with directions for their use, the outfit retailing at 25 cents.

The Cramer Dry Plate Company, St. Louis, Mo., has sent us a copy of its new X-Ray Manual, in which this special branch of photography is dealt with clearly and comprehensively by an expert. For those who use x-ray photographs, or would like to know how they are made, this handy little manual will prove a valuable guide. It can be had on request from the G. Cramer Dry Plate Company without charge.

The innumerable ways of making money with the camera are being more and more opened out in these latter days. Many of our contemporaries are now printing, month by month, a list of concerns which can use photographs for one purpose or another, supplementing the list given in THE PHOTO-MINIATURE No. 120: *Marketing Photographs for Publication.*

The Bausch & Lomb Optical Company, Rochester, advise us that they are willing to pay for any negatives of subjects suitable for pictorial advertising in catalogues, circulars, etc., provided that the pictures were made with lenses listed in their catalogue. This standing offer is worth attention. The Bausch & Lomb Optical Company's new catalogue, by the way, is a most interesting bit of book-making, and should be seen by all who are interested in the latest achievements in photographic optics.

A useful little device for mounting photographs on any sort of support, and in any desired position, without injuring the prints, is found in Engel's Art Corners, which are sold by the Engel Manufacturing Company, 1460 Leland Avenue., Chicago, at 10 cents a hundred. The Engel Art Corner consists of a square of gummed paper, so pierced as to hold the print securely, the corner being simply wetted and attached to the support or mount. These corners come in a great many varieties of different colored papers, silver and gold, etc., and are exceedingly convenient in everyday use.

An interesting booklet of twenty-six pages comes to us from George Murphy, Inc., New York, describing and illustrating the Royal Foreground Ray Screen, which gives equal exposure to sky and foreground in an outdoor view; Royal Ray Filters, for giving absolute tonal values with orthochromatic plates; Eagle Ray Filters, for general use in view work, embracing distant objects, mountains and marine subjects; Eagle Copying and Enlarging Lenses; the Eagle Portrait Lens; the Eagle Wide Angle lens; the Eagle Telephoto Lens; and the Eagle Duplicators, all these last being simply supplementary lenses, which are slipped over the ordinary lens of the hand-camera, as their use may be indicated. These optical helps are all listed in various sizes, for different hand-cameras, and are obtainable at nominal prices. Copies of the booklet may be obtained without charge, on application to George Murphy, Inc., as above.

The good work attempted in THE PHOTO-MINIATURE, No. 97, to wit: An urging of a wider appreciation of the great convenience and remarkable possibilities of the modern small-sized camera, seems to be producing good fruit, the popularity of small hand-cameras having increased wonderfully during the past year or so. Among the small compact hand-cameras of today, the Sylvar Camera (G. Gennert, New York) is one of the best, and should be seen by those looking for an instrument of great efficiency at a moderate price. The descriptive circular obtainable from the manufacturer shows the camera and its work, giving specifications which will enable the buyer to see what it offers in the way of convenience and efficiency. I have seen a good deal of interesting work done by this camera in the hands of an amateur of average intelligence, and can recommend it.

The many applications and increasing use of photography in the sciences and industries have led the Syracuse University, N. Y., to establish a Department of Photography in its College of Fine Arts, giving instruction in all branches of photographic work. The University has been enabled to do this by the generosity of an alumnus who does not desire to have his name mentioned. The aim of the department is to provide for students a thorough grounding in the optics and chemistry of photographic processes ; a practical course dealing with every department of photography ; the art training necessary for the expression of pictorial feeling in photography, and advanced or specialized courses to enable students to take positions as studio-workers, photo-chemists and investigators. The instruction, it is promised, will be eminently practical, and will, at the same time, give the theory of the different processes, while the classes in drawing will include composition cast, portrait, sketch, painting of still life, and anatomy.

The course was opened with the winter term, January 6, 1913, and will be in charge of Mr. E. J. Wall, F.R. P.S., author of *The Dictionary of Photography* and many other photographic text books.

This departure is of such obvious interest that I make room for the following particulars, quoted from the announcement issued by the University.

"Requirements for admission: Candidates for admission to the course in photography are required to show by examination, or by certificate, that they have studied with satisfactory proficiency, the following subjects, viz, English grammar, geography, arithmetic, American history, together with two years of high-school work, which must include elementary chemistry, physics, elementary and intermediate algebra and plane geometry.

COURSE OF STUDY

First Year

General Optics.—Reflection, refraction, dispersion and diffraction of light. Elementary photometry. Light standards.

Photographic Optics.—Optical glass ; the general principles of lens construction ; lens aberrations ; choice and use of lenses for special work.

The Camera.—Various types with instructions in the use of the same for general, portrait, landscape and architectural work. Instantaneous shutters and testing the same.

Exposure.—The illumination of the subject. The factors controlling exposure.

Sensitive Materials.—Plates and films, ordinary and color-sensitive. Color filters.

Development.—The chemistry of developers and development. Time, thermo and tank development.

Printing.—Silver printing; development processes. Platinum Transparency making. Lantern-slides and projection.

Second Year

Studio Work.—General principles of lighting by day and artificial light; groups, copying of black and white and colored objects. Retouching the negative.

Printing.—Printing in iron salts; carbon, gum bichromate oil and bromoil.

Color Photography.—The spectroscope; the science of color and photographic reproduction of the same by the additive and subtractive processes.

Photomicrography.—The miscroscope, principles of construction and use; high and low power photomicrography.

Stereoscopic Photography. — Binocular vision; the practice of stereoscopic photography.

Elementary emulsion making.—Negative and positive processes; printing-out emulsions.

Plate Testing.—Sensitometry of ordinary and color-sensitive plates; spectrographic testing.

Enlarging and reducing.—Principles and practice of the two methods.

Advanced courses will be arranged as required in wet collodion; collodion emulsion; line and half-tone etching; photogravure; motion-picture photography.

All students will be expected to provide such sensitive materials, chemicals and apparatus as may be considered necessary for carrying out ordinary practical work.

A laboratory fee of $5 will be required each term in connection with the darkroom.

Research Work.—Students who are sufficiently advanced will be assigned a problem for investigation, occupying one or more semesters. This assumes some knowledge of Physical Chemistry and German.

The tuition for the course in Photography is $30 a term (one-third of the year). There is also an incidental fee of $5 required each term, and a matriculation fee of $5, payable on entrance.

For further information concerning this course, address George A. Parker, Dean of the College of Fine Arts, Syracuse, New York.

Burke & James, Inc., of Chicago, are offering a splendid service to amateur and professional photographers in the innumerable leaflets and booklets which they publish free of charge, describing in detail, with illustrations, their many photographic conveniences and specialties. Taking a bunch of these just to hand we have described in one a series of eight or nine Ingento Focusing Magnifying and Retouching Glasses; in another a series of six Ingento Retouching Desks in various styles and prices; in a third seven ingenious Tripod Conveniences; and in another we have a full list of all the different varieties of Ingento Tablet Chemicals for a hundred different uses. The reader who wishes to spend an interesting half-hour could not do better than to write to Burke & James, Inc., asking them to send a collection of their recent advertising leaflets.

A wonderful developer is Duratol, which is marketed by Schering & Glatz, 152 Maiden Lane, New York. The working of this developer, and the many ways in which its use simplifies darkroom work, with formulæ for tray and tank development, as well as for development and bromide papers, is fully described in a booklet titled "Practical Simplicity in the Dark Room," by D. F. Urquhart, Jr., which Messrs. Schering & Glatz will gladly send to anyone asking for it.

Pastoral: James Thomson

414

The Photo-Miniature
A Magazine of Photographic Information
EDITED BY JOHN A. TENNANT

Volume XI FEBRUARY, 1913 Number 123

Enlarging on Gaslight Papers

There is no gainsaying the world-wide popularity of development, or "gaslight," papers for the making of photographic prints. In America, today, fully 70 per cent of all the prints made by amateurs and professionals are made on one or another of the almost innumerable varieties of these papers. This popularity is based on the fact that development papers offer all sorts of advantages not possessed by other photographic papers, which advantages are so well known and so widely appreciated that it is needless to discuss them in detail here. And yet, although nearly twenty years have passed since Dr. Leo Baekeland, the inventor of Velox—the first development paper—brought to me his first successful gaslight prints, it is only latterly that photographers have interested themselves in the use of these papers for the making of enlargements from small negatives. Doubtless the well-established use of bromide paper for enlarging purposes has had much to do with the reluctant recognition of the advantages of development papers for the making of enlargements. Or it may be that the strange hesitancy of the manufacturers of gaslight papers to exploit the use of their papers for this purpose is the more sensible explanation of the mystery. Be that as it may, the always progressive amateur is today insistent about the simplicity and convenience of gaslight papers for the making of enlargements of moderate size from his pocket-camera negatives, and equally insistent that he should be provided with practical working methods of using these papers for enlarging. This number of THE PHOTO-MINIATURE is intended to fill this need. It gives the experience and well-proven methods of an amateur who has devoted the leisure of two or three years to the task of working out the simplest ways of producing enlargements on development papers. It has the novelty of being the first handbook to the subject in the language, and the merit of offering practical ways of reaching practical results, without theorizing or useless digression. In these days, when photography is so much over-written about, it is unusual to meet with so interesting an adventure in fresh fields and pastures new, and I am sure that the discerning reader will join with me in thanking Mr. Thomson for his goodwill in so patiently and so carefully setting forth his hardly-won experiences for our help and pleasure.—[EDITOR.]

The splendid way in which the manufacturers of gaslight papers have developed the possibilities of their products is a familiar matter to all who have watched the growth of amateur photography for the past ten years. To people of taste and art impulse the gaslight print was for long anathema, seeming to lack so much in quality when compared with other black-and-white papers, such as platinum and bromide. But that was away back in the nineties of the last century. Today, as may be seen in our exhibitions and in the show-cases of noted professional photographers, the gaslight print is equal in every desirable quality to the finest prints obtainable by any other process or printing medium. So much for quality. Facts are indisputable. Let us take up the advantages of gaslight papers for the making of enlargements from small negatives.

Advantages for Enlarging

In manipulating, no darkroom is required. We may work by day, if we like, by taking the precaution to filter all white light coming through the windows by the use of shades of some warm or dark translucent material. Some brands of gaslight paper are extra-speedy, in which case we must simply exercise more than ordinary caution in handling. Precisely how careless one can be with safety may be determined at any time by testing the light with a strip of the fastest brand of paper. Expose (in part) for a minute, and if on development there is no material darkening or tint on the exposed strip, one can rest assured that the illumination is safe; nothwithstanding which it is best to be on the safe side by taking unusual precautions not to unduly expose the paper to light during manipulation. These precautions are equally necessary when working in brilliant artificial illumination.

Another advantage over bromide paper is the large number of brands to choose from. There are at least half a dozen brands of gaslight papers and, at smallest, three grades of contrast. One maker boasts of twenty-three distinct varieties. Surface texture, too, there is in variety, and many of them most artistic. New effects are due "every little while." It is, indeed, the adaptability of the gaslight paper that commends it in great measure as a printing medium. The scientist discovers in the semi-matt surface a preserver of all fine detail, or perhaps he turns to the glossy surface when he would fain make large the head of a fly; while the pictorialist finds in the rough surface the very thing he wants in the rendition of artistic breadth and atmosphere.

Rapidity

As regards speed as affecting enlarging, it is an error to hold gaslight papers as too slow for practical use. Slow certainly they are when compared with bromide paper; but then were they faster the special advantages pertaining thereto would vanish. As a rule, the gaslight papers used in enlarging are approximately some ten to twenty times less rapid than bromide paper of the speediest grade.

Erroneous ideas regarding the speed of developing papers as affecting enlarging have doubtless had inception in the performances of some enlarging apparatus of the cone variety which, fitted with single lenses of the achromatic meniscus type, require the employment of a very small stop in order to overcome the effect of spherical aberration, and thus obtain reasonably good marginal definition. No such a lengthy exposure is needed when so good a lens as a rapid rectilinear is used, and at present most cameras of the folding type are fitted with a doublet or rectilinear lens.

The fixed focus enlarger, however, has its uses. It provides a ready means of making big pictures from small films when people are not pressed for time, and can wait half an hour, if need be, for what they want. Always in focus, one has but to expose for a given time in order to get a reasonably large positive print from a more or less diminutive negative.

How I Began

Through the year 1909, and off and on since that period, I have been experimenting with gaslight papers as an enlarging medium. Starting work with the idea that an exposure of some fifteen minutes would in such cases be surely necessary, I finally found myself making 8 x 10-inch enlargements in as many seconds. Had my lens been an anastigmat, I could have done it in even less time. Needless to remark, this was a great surprise, as I had been led to believe from reading the Brownie-enlarger advertisements that from fifteen to thirty minutes exposure to the light of the sky would be necessary with a paper of the Special Velox class.

Apparatus

I further spent some months experimenting with apparatus of a portable character, the object being to devise a cheap yet effective instrument that could be easily home-fabricated by anyone handy with tools, and who could command a couple of boxes, a lens, and a rubber focusing cloth. Inexpensive portable enlargers in great variety are to be had at small cost in Great Britain, but in this country they seem to be, generally, more expensive than abroad; hence the necessity for home effort in this particular direction.

Enlarging with the lantern has, of course, great advantages where a number of enlarged prints are to be turned out with celerity and dispatch. Not all workers, however, have the means of purchase, nor the artificial illuminant upon which operation is dependent. The average amateur has no large amount of money to spend for such an outfit, hence, in the absence of some cheap means of enlarging from his, perhaps, diminutive negatives, he perforce is obliged to depend on supply houses for such enlarged pictures as he must have; and how indifferently bad sometimes such work is need not be more than mentioned.

Efficiency and Expense

The amateur who wants but a few enlargements from time to time need have no hesitancy in adopting daylight equipment with a fixed or portable enlarger. A good deal has been said about the variability of daylight, but do not most forms of artificial lighting vary? Unless an incandescent mantle is watched carefully and tested from time to time, a quite perceptible variation in the strength of the light is not uncommon even in ordinary household use.

Certain it is that commercial workers have utmost need for celerity. They need the best possible means of turning out enlargements, but many amateurs have not the thirty to sixty dollars required to fit up for making prints as large as 8 x 10 inches. Even with daylight as an illuminant, enlarging as a business can be made to pay, either using portable apparatus, or, what is much to be preferred, a blocked-up window equipment, in which latter case enlargements limited only by the size of the room are possible.

Home-made Enlargers

In the December, 1909, number of *American Photography* was an article in which I described a portable camera I was then using. In the April, 1912, issue of the same magazine, a Canadian worker, Mr. W. A. Gordon, gave high praise to a camera he had made after my model, averring that, so far as output is concerned, it does splendid work up to 16 x 20 inches, and cost him, outside of the labor of making, but a dollar and a half. To duplicate such an instrument he declares would cost him sixty dollars, were he to buy it in the market complete as it stands. With this enlarger, using daylight as an illuminant, he, as a professional photographer throughout a farming district, is making money, a good part of of which comes from his trade in enlargements. Nor does he sell his product cheaply, the prices he obtains for his work are liberal. The model this gentleman so highly values I have dubbed "No. 1," to distinguish it from "No. 2," a much more convenient instrument which I now employ, and which I shall farther along describe in detail.

What is Gaslight Paper Such a printing medium is often called development paper, though that is not a very accurate description, because platinotype is also a development process. "Gaslight" paper is more fully descriptive because the exposure is usually made by artificial light, and gaslight is the most generally used illuminant. In the pioneer days we called this paper "slow bromide," though, as a matter of fact, we were wrong. The sensitive film is a chloride of silver emulsion, which before coating is carefully washed, so as to eliminate all the soluble silver salts which, if permitted to remain, would result in what is called "fogging" of the image. When there is free silver, the whites are apt to be impure. Such papers therefore are "washed chloride" papers, and in certain respects are markedly superior to bromide papers. The rapid brands of the class, such as Artura Carbon Black, are perhaps some ten times less rapid than bromide paper, which latter, again, usually approximates in speed a slow dry plate.

Brands to Use The "regular" grades of development paper are not advantageous for enlarging purposes save in rare instances. They are both slow and productive of harshness of contrast, often having an unpleasant sooty quality in the enlarged print, "Soft" grades are more suitable, for the reason that in process of enlarging there is much more contrast than would be the case with contact printing from the same negative. Only in the case of an extremely flat negative must recourse be had to the "hard" grades, such as regular Velox and contrast Cyko, Chloralla, etc. Of course those who like crisp enlargements, with clear-cut detail and well-defined images, such as we get in the regular contact print, will doubtless prefer to use the "regular" or "contrast" papers. The precise effect desired in the enlargement, whether soft and broad, or clear and full of detail, will determine the choice of the grade of paper used for the individual worker. This is one of the advantages of gaslight papers: there are so many varieties.

"Soft" papers in expert hands moreover have much greater latitude, increased exposure conjoined with developent in dilute solutions resulting in normal contrast even when a flat negative is used. Contrast is also subject to control through the accelerator employed ; thus carbonate of soda results in normal effect, while carbonate of potash may be depended upon to give considerable increase over the other.

In the presence of great diversity in the speed of papers, it is just as well not to work with too many kinds of paper at first, or confusion will result.

How to Choose

In the choice of an enlarging paper, the question of speed bulks large. All things being equal, the quicker we gain our ends the better, hence the more rapid brands of developing paper are most likely to find favor for enlarging purposes. There is also the question of cost. Do not judge the value of a paper by the price asked for it. Demand very often dictates the price, regardless of results. I have found the moderate-cost papers to give as good results as the more expensive in many instances. As regards quality, it is not difficult to test a paper with microscope, test-tube and graded printing-screen; hence there is small use in making claims that are subject to revision by mere outsiders. See THE PHOTO-MINIATURE, No. 78, for a practical method of testing any printing paper.

Velox

Velox was the pioneer paper of the class. There was originally but a single grade, and that the "Regular Carbon," which was both slow and contrasty. To get good results required (and today requires) that a special, soft negative be employed. In due time came Special Velox which, besides being softer than the original and therefore adapted to portraiture, has much greater speed. All along the line there has been immense improvement in this particular printing medium, until at the present time we find the professional worker pinning his faith on it as a vehicle for pictorial printing from all sorts and conditions of negatives.

A few observations on the brands of papers best suited for our present purpose may not be out of order, not in the way of making invidious distinctions, but solely to guide the seekers after such knowledge in judiciously selecting what is for their best interests to have.

Artura

Of the Artura line of papers, the brand best suited for enlarging is, fortunately for us, the least expensive. I refer to Artura Carbon Black, a soft working paper with a long range of gradation. It is also the speediest gaslight paper within my knowledge. While soft results are to be had with it, contrast also is possible by increasing the exposure and modification of the developer. Results have been had with this brand of paper that cannot be duplicated with any others. Because of the great speed *precaution must be exercised in handling.*

Cyko

Soft Cyko is also a splendid medium for enlarging. Not quite so rapid as Artura—requiring an increase of exposure of perhaps 30 per cent—it will please the pictorialist because of the fine gradation possible with it. The Normal Grade (yellow label), however, I doubt not is best for general purposes, resulting in considerable vigor where average negatives are involved. Professional Cyko is so slow a brand—excellent as are results with it—that it may not find favor with the amateur enlarger, especially when he depends on daylight as an illuminant in the dark winter months. It is slow both in development and speed of exposure. With the arc lamp or the lime-light exposures can be shortened, so that this objection does not apply where these are available.

Chloralla

The contrast grade of Chloralla is well spoken of by professionals, who seek clear, well-defined detail in their enlargements, with a good range of tone gradation. This paper, however, is obtainable in Soft, Normal and Contrast grades, with three surfaces: semi-matt, glossy and matt, a variety which affords room for every desired effect. I have not had an opportunity of giving Chloralla a practical trial, but the repute of its maker (G. Gennert, New York) should warrant its quality.

Argo

Argo Portrait and Special Portrait grades are fast enough for work in a good, bright light, but a trifle slow when the dark days of winter set in. Pictorially, results are excellent with these papers, the image being a warmer black than is customary when M-Q developer is used. In this regard Argo papers differ from all similar brands that have come my way. As a rule, with many papers where normal exposure is given and the developing agent used is M-Q, the tones are blue-black. Not so with Argo; warmth of image being the rule, a quality not at all unpleasing.

When very soft, delicate prints are desired, or the negative is one that is extremely hard and contrasty, recourse may be had to Argo Special Portrait. Artura Carbon Black and Argo Special Portrait are the papers to fall back on when all others give too much contrast.

Velox—"Special" not "Regular"—though it is used as an enlarging medium, has not the latitude of Artura. The speed is about the same as Normal Cyko. It will answer for general enlarging purposes when contrast is desired, but cannot be used with normal negatives, unless the developer is modified. It is the one gaslight paper especially recommended by the makers for enlarging purposes, through Artura Carbon Black is much more suitable and better in every way.

Wellington Papers

The Wellington S. C. P. (slow contact paper) in the soft grades is very suitable for enlargements. The De Luxe Soft Art and De Luxe Soft Carbon grades are peculiarly applicable. By their use all fine gradation is certain to be rendered, providing a suitable developer be employed. Cream Chamois is the latest paper, and a good one. It is admirably adapted for sulphide, uranium, and copper toning.

Kruxo

Since the foregoing was written the latest Kruxo booklet has come my way, and there I learn of a late addition to the gaslight family called "Fast Kruxo" which is claimed to be "five times faster" than other grades of the same paper. Such being the case, it is evidently just the thing for enlargements, especially as it is a soft worker. It is too late now to make the necessary tests to determine how this paper compares with the product of other makers as an enlarging medium, but I have no doubt but what it is all that it is claimed to be. In this connection I should advise my readers to avail themselves of the valuable little booklets given away by the various manufacturers of gaslight papers.

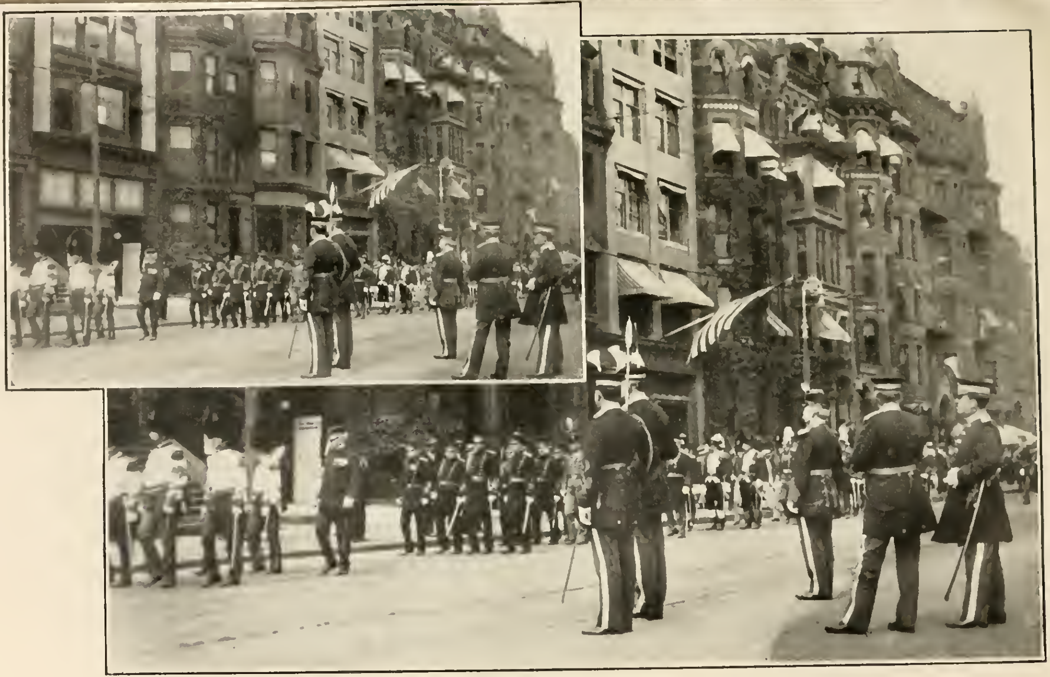
Suiting Paper to Negatives

In photographic practice there are all sorts and conditions as regards negative. With such a paper as Solio, a flat negative gives a flat result, a contrasty negative a vigorous one, and there is no remedy short of intensifying or reducing the negative. Otherwise is it with developing paper, where we find in the "contrast grades" precisely what is needed for the one, and in some one of the "special soft" grades what is needed for the other. We have also always at our command the power to be had from modification of exposure and developer. It matters not what the quality of the negative, the expert worker can get any reasonable amount of contrast, and, at the other end of the scale, the utmost delicacy of gradation, solely by variation in handling, or by choice of paper used.

Why and What to Enlarge

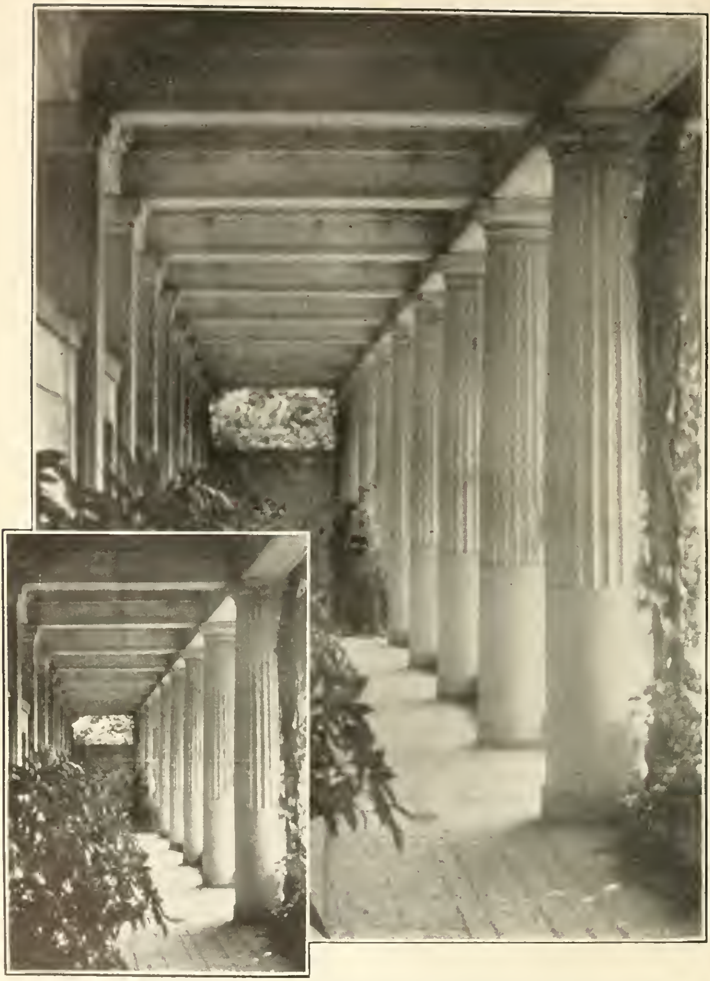
The small print primarily intended to be viewed at close range quite loses its appeal when, on wall or easel, it is surveyed from a distance. To do justice to the composition, when thus viewed at a distance of a few feet, it must needs be enlarged, the dimensions depending upon a number of factors, among the chief of which are the quality of the negative and the focusing capacity of the enlarging objective. When the negative is one made by a high-grade lens, such as an anastigmat, there is fine definition to the very edge, providing due attention was given to accuracy in focusing. At the same time, the depth of definition in small pictures made with cheap and short-focus lenses must not be overlooked. If only the center is used, excellent enlargements are possible; but the greatest fault in such pictures, as a rule, is lack of rectilinearity, poor definition at the margins, and distortion of foreground objects.

What does not help, hurts; therefore the necessity of ruthless discarding before attempting to enlarge. Where distortion, exaggeration of foreground, convergent lines, and toppling walls obtain, the artist should



Parade of the Ancient and Honorable Artillery, Boston

Original (at left) 3 x 4½ inches, enlarged to 5 x 7 inches. James Thomson



Cloister in the Italian Garden of Lars Anderson, Brookline, Mass.
Original 3 x 4 inches, enlarged to 5 x 7 inches. James Thomson

quickly come to the conclusion that they do not help, hence are hurtful. They are not elements of strength, hence it is better to sacrifice them in the enlarging of the picture. It takes some courage to cut down a picture already too small, but it is the only way to do if we would make enlargements of which at a future period of enlightenment we need not feel ashamed.

Daylight or Artificial Light

Enlarging can be done by both daylight and artificial light, the latter having the advantage in constancy, and hence under control of the operator. Daylight is variable, changing from hour to hour, and yet, in a country of clear skies the greater part of the year, much can be done with it, using apparatus both fixed and portable. To fit up for daylight enlarging costs but little beyond the labor involved. For the worker who wants only a few prints it is worthy of consideration. Even the man who works for financial advantage can make it pay, as has been proved.

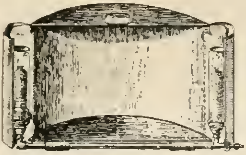


Fig. A

The enlarging methods at our service are multiple and diversified. Almost anyone, therefore, should be suited. It is not a process available only by the man of means, though considerable money may be thus invested when such is the dominating desire. Splendid results are to be met with, however, where, outside of the labor involved in the making, the equipment has cost precisely nothing at all.

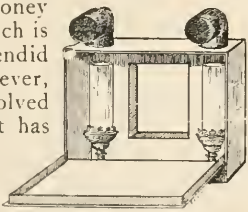


Fig. B

This, however, is no brief for makeshift methods. The outfit should be suited for its work, which it cannot be when of a temporary, shiftless character. Notwithstanding this, overmuch stress may be put on equipment, and not enough on the individual working it. In the ordinary photographic field, there are workers of the gilt-edge type who are turning out common work, while others with out-of-date cameras, fitted with perhaps but a single lens and no shutter at all, are producing results that are the envy of their fellow-workers. It is likewise in the enlarging field, and this little book, among other things, is designed to help workers who have little money to spend, and yet would fain have enlargements made from valued negatives by personal effort and skill.

Choice of Equipment

The enlarging aspirant has a considerable choice in regard to equipment. First.—He may utilize his own camera with a home-made enlarger, which may be either of the blocked-window order or portable apparatus, the illuminant being daylight. Second.—He may buy an outfit of the portable order, the field of selection extending from the Brownie Enlarging Camera, costing from two to four dollars, along the line to a high-grade instrument with every adjustment, retailing at from thirty-five to ninety dollars. Third.—If possessing the necessary skill, he may trim out a reflecting lamp along the lines of Figures A, B, or C, his own camera here coming into play, the illuminant being incandescent gas, the electric current, or magnesium ribbon. Fourth.—Again utilizing his own camera, he may decide to buy one or other of the foregoing lamps. Fifth.—He may invest in a high-grade enlarging lantern, such as the

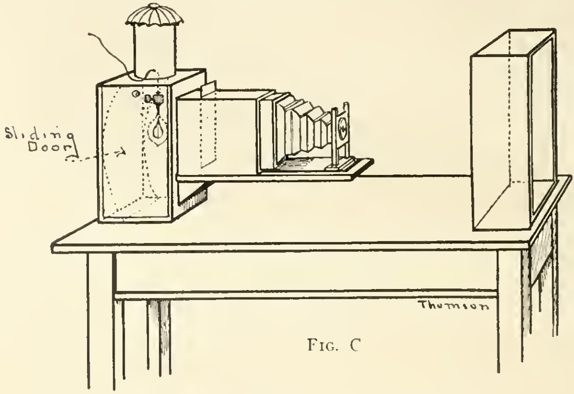


FIG. C

Ingento, where the choice of illuminant is extensive (exclusive of daylight), the electric current, gas, acetyline, gasolene vapor and magnesium ribbon. Or the "Ideal," burning oil, incandescent gas, gasolene vapor, etc. Or the new Victor Enlarging apparatus, which seems to promise great convenience to the amateur enlarger.

The Prize Enlarging Lanterns, adaptable for gas or electricity, are thoroughly efficient instruments of the better sort; while the New Soldak Camera is a well-known enlarging camera which has proven its great usefulness. This camera can be had with a high-grade lens equipment, or without the lens, in two convenient sizes. (G. Gennert, New York.)

Commercial Daylight Enlargers

Providing the worker is modest in his desires, he may find in the Brownie Enlarging Camera what will satisfy. Or he may go further and for a little more money get the Ingento Daylight Enlarger, an instrument that is compact, convenient, and portable; he may go still further, and invest in a Kodak Enlarging Camera, which makes 6½ x 8½-inch enlargements.

The "Brownie" and "Ingento" enlargers are simple, effective, but necessarily somewhat slow. There is also the Graphic Enlarging Camera, requiring no condensers, where an artificial illuminant is employed; though, so far as that goes, artificial lighting is possible with any of the foregoing.

Some of the more expensive and pretentious instruments are the Crown and the Folmer and Schwing Enlargers. Such enlarging cameras offer many conveniences, being also adapted to copying and reducing. The enlargement, however, is governed by the size of the exposure board, hence they have limitations in this regard. These instruments have all adjustments, work with precision, and are the last word in efficiency.

A Permanent Equipment

When the equipment is a permanent feature in a room, one can dispense with a camera altogether, as shown in Figure J. Here we have a lens mounted upon the end of a box, which telescopes into another box in the fashion of the old-time camera obscura. A rapid rectilinear lens could be bought cheaply at second hand, and thus mounted. It may be superfluous to add that, in the present case, focusing is effected by sliding the box B in or out of the fixed box A.

The Lens

It should be remembered that the value of an enlarging outfit to a great extent depends on the quality of the objective. Enlarging can be done with a cheap single lens, but we hasten matters fourfold with a "rapid rectilinear," and speed up still more with an "anastigmat."

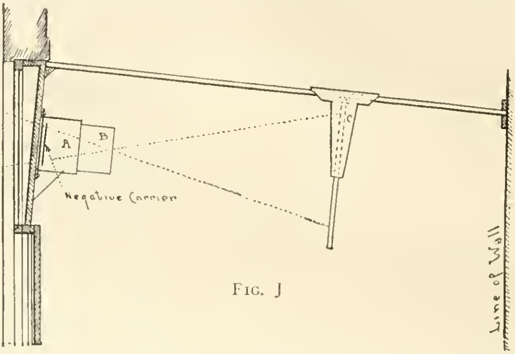


FIG. J

Fixed-focus Enlargers

The fixed-focus enlarging camera, cone-shaped or rectangular box, is an instrument of potential interest, not alone to the amateur who wants a print now and then, but to that other who aspires to do business for profit. As usually sold, it is a paper cone, negative at one end, sensitive paper at the other, while at a certain point somewhere between is a lens mounted on a board. This lens, usually of the single achromatic meniscus type, requires to be stopped down to a very small opening, in order to overcome aberration and insure something of reasonable definition at the margins of the image. Consequently such an enlarger is a slow printer, but the fault is entirely with the lens. Given so good an objective as a rapid rectilinear, the exposure can be hastened fourfold. It is unfortunate that this particular form of enlarger has been, as a rule, associated with cheap and slow objectives.

As an inexpensive and ready means of enlarging, this form of enlarger furnishes an outfit that is available for even the smallest purse. Fit it with a good lens and it will do excellent service. An enlargement of 8 x 10-inch dimensions is possible, the camera taking 4 x 5-inch negatives. It will then accommodate all negatives and films smaller than 4 x 5, with the resultant dimensions as regards enlargements as follows: Brownie No. 1. 4½ x 4½; No. 2, 4½ x 6½; No. 2 a, 4½ x 8½; No. 3, 6½ x 8½. The wide scope of such an enlarger is thus easily demonstrated.

Working for Profit

Again, take the man or woman of small means, anxious to add to his or her income by making enlargements with the least possible trouble. For such my advice would be this: Make three boxes to take 2¼ x 3¼, 3¼ x 4¼, and 4 x 5 negatives, respectively. There may be but one lens available for the three, but the change from one to the other could be easily effected by mounting the shutter upon a board made to slide into a sort of pocket in the enlargers. With such a battery of enlargers an immense amount of work could be done, and with automatic exactitude. It would, of course, be most advantageous for each enlarger to have its own lens. Then, while one individual kept the three enlargers going at the exposure end, another could attend to developing. There is no reason, of course, why enlargers should not be made for one size of picture, say 8 x 10, but the box made to take its own size of negative, and produce but one size of enlargement, would be best where work is to be done with expedition. Once the exposure for a given negative was known and noted, a child could, if need be, understand the management of the box.

A Home-made Fixed Focus Enlarger

Square up the strips and nail together the back and front frames. Fill in the frame intended for the front with half-inch-thick board, so that there is an opening left in the center a trifle smaller than the negative that is to be used. Cut an opening the exact size of the negative in a black carbon mounting-board. The card should be of the same thickness as the glass. Nail this card, with cut-out for the negative, on to the front frame, the openings in both in position being then coincident. There will then be formed a rebate all around to receive the negative, the latter being held in place by swivel buttons of brass or wood. The body of the enlarger can be made of cardboard, strawboard, thin wood, or the corrugated board now so generally employed for folding-boxes. Personally, I prefer the latter because of freedom from tendency to curl or warp.

With a sharp knife cut the board to appropriate length, and in width to fit snugly inside of the back and front frames. Nail to the frames the two side pieces and the bottom, leaving the top piece off until the lens board is accurately placed. Inside of the frame nail narrow wooden strips, to keep the body of the camera firm, and in the back frame, to form a rebate to receive the exposure-board. To bind the joints, use gummed cloth, rubber tape, surgeon's plaster, or, on a pinch, passepartout binding In the rear box a sheet of clear glass of good quality should be fitted to press close against the rebate. This glass should be removable, but, while in place, should be wedged so that it cannot easily fall out. A board covered with cotton flannel on the inside is then fitted snugly in the opening. It is to be used for pressing the sensitive paper close up against the glass, and should be held in position with buttons. Before the lens-board is in place, line the inside of the camera with black needle paper. Simply paste along the edges, for if pasted all over it will, when dry, draw the body out of shape. Woodwork, out and in, should be stained black.

A Suitable Lens

The cameras herein illustrated are all, as regards dimensions, calculated for lens with a focal length of five inches, which is the usual focus of a lens from a box camera which makes a 4x5 picture. If one has a folding camera of the cheaper sort that takes 4 x 5 pictures, the lens is likely to be of 5- or 5½-inch focus. The R. R. lens fitted to the better sort of folding cameras is usually fitted to a double-valve shutter, which screws into a flange upon the lens-board. Fit a similar flange to the enlarger, and the lens from the folding camera can be made to serve a double

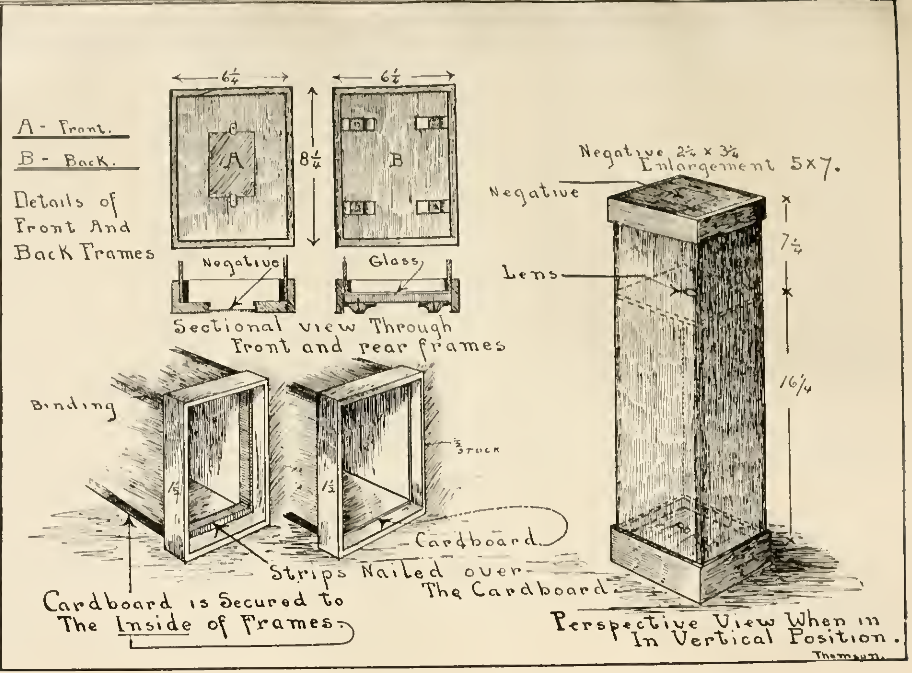

A - Front.
B - Back.
Details of Front And Back Frames
6¼
6¼
8¼
A
B
Negative
Glass
Sectional view Through Front and rear frames
Binding
1½
1½
½ STOCK
Cardboard.
Strips Nailed over The Cardboard.
Cardboard is Secured to The Inside of Frames.
Negative 2¼ x 3¼
Enlargement 5x7.
Negative
Lens
7¼
16¼
Perspective View When in In Vertical Position.
Thomson.

PLATE I. Fixed-focus Enlarger as described on pages 115–116

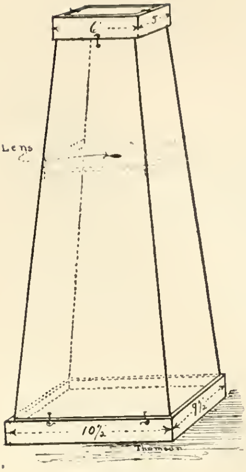


FIG. O

purpose. Remove the shutter, and the change from one to the other is easily effected.

When an R. R. lens is not available, a single lens of the meniscus variety may be made to serve. Even a two-inch reading-glass, uncorrected for color though it be, can be used to make enlargements by concentrating the rays to a small opening, say an ⅛-in hole. This, of course, means loss of speed; but there is no other way to get marginal definition with a simple convex lens.

The foregoing is descriptive of the rectangular style of fixed-focus enlargers, as shown in Plate 1. Figures N and O delineate another form, i. e., the cone-shaped enlarger, after the manner of the "Brownie." O shows the camera com-

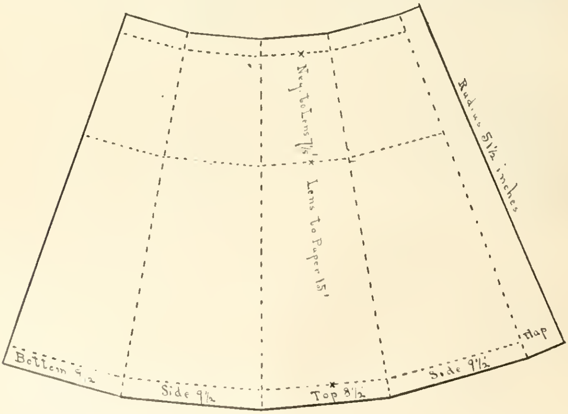


FIG. N

When Winter Lingers: James Thomson

5 x 7-inch enlargement from a pocket camera negative

Early Morning: James Thomson

plete set on end ready to take pictures. N gives a plan of the body, which should be fashioned from tough cardboard of some dark color. When a piece of cardboard big enough is not available, the body may be made in sections, the seams being held together with gummed tape

Three years ago, simply to satisfy myself that "some things can be done as well as others," I made a rectangular box-camera for enlarging. I fitted to it a common 2-inch reading glass, stopping down when exposing to an aperture of ⅛-inch. From 4 x 5 negatives excellent 5 x 7 prints were made by focusing for 6½ x 8½ dimensions. By thus focusing, we cut off marginal definition that has a falling off in sharpness. In the following pages the mode of focusing is explained:

Getting a Sharp Image

The lens being in place, put a contrasty negative in the kit, and for a screen at the rear a sheet of ground-glass, *dull side inward*, pressed close up against the clear glass. Point the camera upward at a window, then cover over the top part (for the time being unfinished) with a cloth, to exclude the light. Move the lens-board back and forth while looking through the screen, and when the image is at its sharpest nail the lens-board in place, which can be done by inserting it from the outside. Narrow, blackened wooden strips should then be glued to keep the lens-board perpendicular. After the lens-board is in position, fasten on the section of the body (until now left off), and secure the seams with binding. When a half-inch stop has been used for focusing, and a large-size magnifying glass is held in the hand, quite a sharp image can be focused; but in the case of a cheap single lens it is best to get sharpness, not at the center, but a trifle above it.

The foregoing has in view the use of a mounted lens. When an unmounted lens is used, a section of mailing-tube, or shaving-soap tube, is useful for mounting.

A hole big enough for the tubing may be bored in the lens-board, in which case one need not be so particular in placing the latter. To obtain a sharp image, all that is then necessary is to move the tube back and forth until the image is in focus. When this has been done, the lens-tube may be fixed permanently with passepartout binding.

Theoretically, of course, we know exactly where the lens should be to be in focus; but practically it is necessary to determine the exact location by trial and error until a sharp image is secured.

The Thomson Portable Enlarger No. 1

Plate 2 shows a camera made on the lines adopted by Mr. Gordon, though he has adapted it to a horizontal position. This enlarger is suitable for enlarging from a window, or, in lieu of that, placing in a vertical position out-of-doors. Anyone who can use tools can make such a camera in some sort of fashion, and, if a nicer job is desired, a carpenter could furnish the necessary woodwork all planed and cut to sizes. When made to take 16 x 20-inch enlargements, the better plan is to have it arranged horizontally upon a table. When at an angle upon a table, the negative pointed to the sky, there is then obtained the full benefit of the light, because in this case there is needed no diffusing screen, the use of the latter doubling the exposure.

The length is, of course, dependent on the focal capacity of the lens employed, while the dimensions of the lower box are governed by the size of enlarged picture likely to be required. The lens used is one from a folding hand-camera, and is 5½ inches in focus. The largest negative that can be enlarged from is 4 x 5. Fully extended, the length is 28 inches, the outside measurements of the larger box (which forms the base) being 14 x 11½ inches, while the depth is 10 inches. The outside upper box is 6 x 7 inches, and 9 inches deep. In this upper box are two smaller boxes which telescope into it, dividing the available space between them, the one carrying the lens, the other the negative. The slide *S* controls the focus, and once the image has been focused sharply for the regular sizes of enlargement, marks may be made upon the woodwork so that there is afterward no need to repeat the operation. There is no slide on the far-off side, the board there shown being simply screwed to the base, and left free at the top, thus forming an excellent bed upon which to slide the upper section of the instrument. To hold the negative, a 5 x 7-

inch kit may be cut down to the dimensions of the inner box, which is 5½ x 6 inches, the opening for the negative being 4¾ x 3¾ inches, with a rebate or sinkage

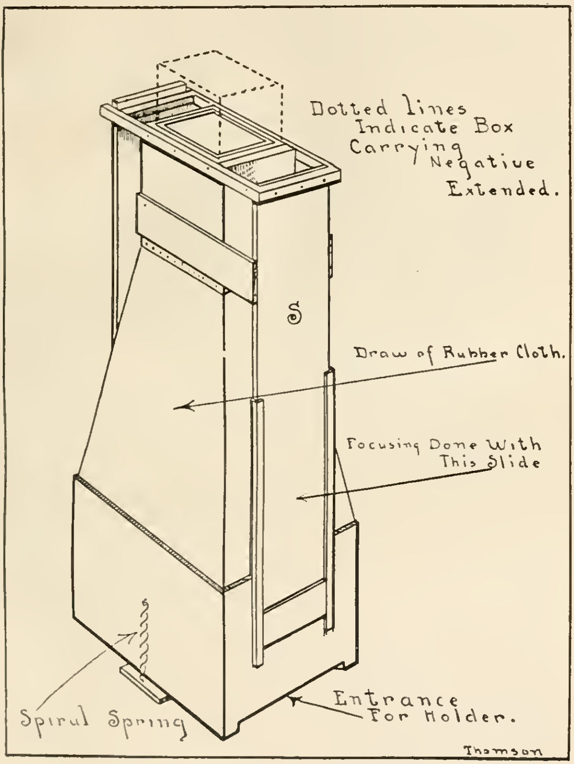

Dotted lines Indicate Box Carrying Negative Extended.
S
Draw of Rubber Cloth.
Focusing Done With This Slide
Entrance For Holder.
Spiral Spring
Thomson

PLATE 2. Thomson's Enlarger No. 1

the thickness of the glass. The draw—which may be secured at the corners—is made of good quality black rubber cloth, or any similar semi-stiff opaque material which will give good wearing service.

The Thomson Portable Enlarger No. 2

The No. 2 camera is but an improved No. 1. The focusing is effected by operating the frame slide upon the side. *A* shows the upper box (as in No. 1 model) into which the box carrying the negative telescopes. In the perspective drawing this extension-box carrying the negative is shown drawn out to full extent. As a rule—say for sizes such as 8 x 10—it is pushed in until coinciding with the outside box. Focusing for the different regular sizes, 5 x 7, 6½ x 8½ and 8 x 10 can be done once for all, and the results registered upon the woodwork. When any regular size of enlargement is wanted, all one has to do is to consult the marks, make the necessary adjustments and proceed to enlarge. confident that the resultant image will be sharp. The control of the focusing while the head is under the cloth is a great advantage.

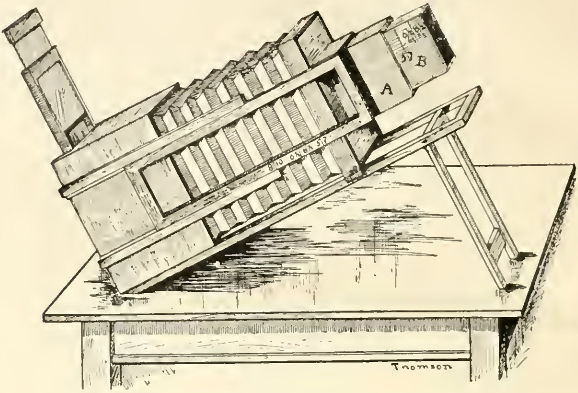


PLATE 3. Thomson's Portable Enlarger No. 2

With most portable enlargers, loading and unloading is done in subdued light in the camera, the whole affair being carried back and forth. There is no need of this if a holder be made in accordance with Figure P. Such an exposure-board is not difficult to make. The board should be of soft wood, such as pine, so as to take the thumb-tacks readily. The slide should be made of heavy black carbon mounting-board.

Making the Bellows

To make bellows may seem a formidable undertaking, and so it might be in the tapering shape and in small dimensions. We no doubt could dispense with the bellows, and in place of it use a sort of sleeve of black cloth. However, where each fold of the draw is two inches deep, such a bellows as this camera requires may be made with a couple of hours' labor.

As a preliminary, spread upon a table sufficient black silesia to form the lining. Paste to it a sheet of the tough, opaque Norwegian manila wrapping-paper now so commonly used for packages. From heavy cover paper or bristolboard cut strips ⅞-inch wide, and trim at the ends to the angle of 45°. Paste down firmly in accordance with the darkened parts of the drawing, Plate 4. Leave spaces between as shown. Next, over all, save that part marked "flap," paste the outside or covering, leaving under pressure for twenty-four hours. The paper ends that project on the left are then pasted *in* between the silesia lining and the outside cover. There is now formed a tube, or tunnel. The folds can then be easily made. I used for an outside covering dark green painted shade cloth. Imitation leather or rubber cloth would answer.

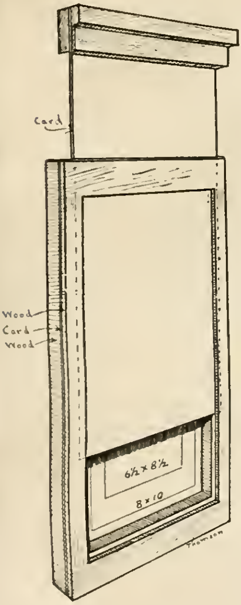


FIG. P. Exposure board for sensitive paper

Non-portable Daylight Equipments

For daylight operation, a system other than the portable is at our service. A room with but a single window, and that facing the north, should, if possible, be chosen. All light save such as comes through the

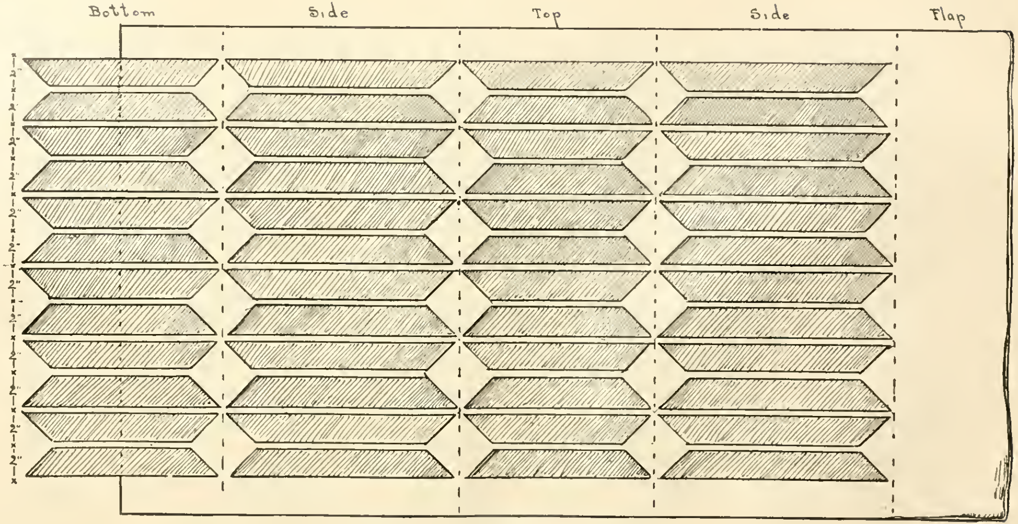


Plate 4. Showing layout for bellows

lens is then excluded. We have then, in fact, a camera with the operator controlling matters from the inside instead of, as is customary, from the outside. When there is more than one window, means must be found to screen them. With so slow a medium as gaslight paper, opaque or semi-transparent shades may answer when dark in color. One may thus have plenty of light providing it be filtered through red, brown or yellow in the shades close to the framework, drawing them down to the full extent.

An Enlarging Room

With a room thus arranged, it is possible to make enlargements, notwithstanding the outfit be one most rudimentary. For example, an empty box may be fastened to the window-sill, the camera (lens inward) placed upon it, and a table upon which is an empty box placed on end, bottom to the lens, set some little distance away. The camera, probably of the short-focus variety, must have an extension attached at the rear, so that the distance between lens and negative is increased. A pasteboard box may be made to answer, a black card forming the back, in which is an opening made to receive the negative, which can be best held in place with gummed-paper strips. Outside light other than that which comes through the lens being excluded, a sharply focused image is thrown upon a white paper sheet pinned to the box bottom, and thus are we ready for the exposure. The light upon the screen will likely show unevenness, the upper section being darker than the lower. There are two methods whereby this difficulty may be overcome: We may place a white card reflector outside of the window to throw the light upward, or we can with a card shade the lightest portion of the image during the exposure. Some of the finest bromide enlargements I ever made came from adopting the latter plan. The largest opening is to be used for focusing, but the usual practice is to stop down for the exposure, though with an anastigmat lens it is quite unnecessary, and with a rapid rectilinear only to a slight degree. Should semi-transparent shades be at the window, there is, of course, abundance of light to work by. Providing, however, a room is totally dark, the

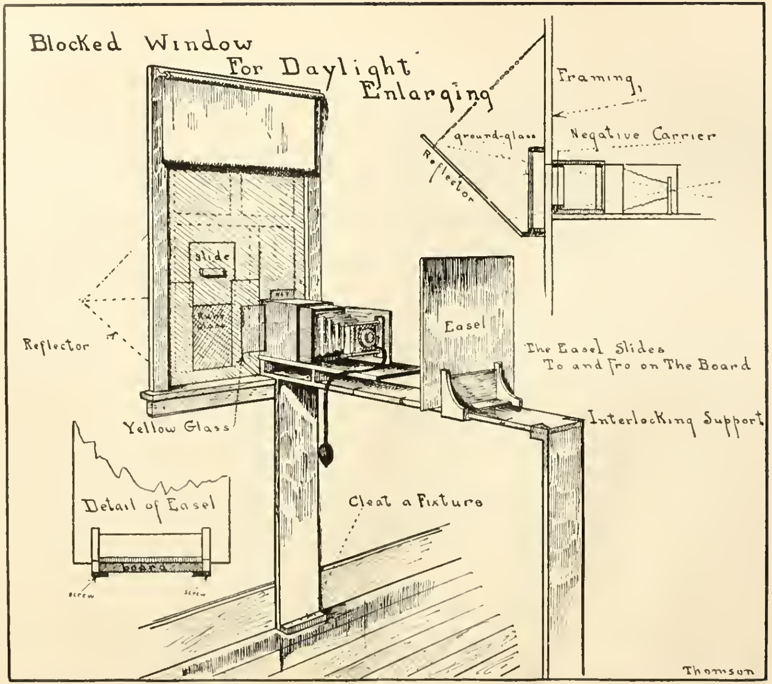


PLATE 5. Showing the window equipment for enlarging in a room

light coming through the lens can be utilized by covering with yellow paper while attaching the sensitive paper, or a small lighted lamp can be some little distance away, or a light yellow filter slipped over the lens tube.

The requsite exposure having been determined through the use of test strips, the large sheet is fastened to the board with small black-headed toilet pins. A paper of such pins should be at hand, when it matters not that some drop on the floor. Push-pins and thumbtacks are a nuisance. Toilet pins enter the wood readily and, when not in use, can be stuck in the lapel of one's coat.

The blocked-window arrangement shown in Plate 5 is such as I have been using for years in bromide enlarging. Changes might be in order, to conform with individual requirement, but it is most convenient to stand on the side of the ruby glass, and there have full control of operations even in a totally dark room.

As a rule, such an outfit is placed on a level at right angles with the wall of the room. To point the negative upward, with consequent depression of the other end of the board, is a much better plan, as the illumination is better and more evenly distributed. The lower sash of the window should be raised, as the green quality of common window-glass is most obstructive. It probably cuts off 50 per cent of actinic power. The whole equipment costs but a trifle beyond the labor involved. A 4 x 5 hand camera fitted with a good quality R.R. lens of 6½-inch focal capacity is suitable. This admits of enlargements being made with *f*/8, though more often *f*/16 is used.

The Window-Frame

There is but a single window in the room, and for this a light frame was made. Strips of whitewood (poplar in some parts) 3 inches wide and ⅜ inch thick were used, the corners being jointed in the manner shown in Figure H. The frame, when made, was covered with black carbon mounting-board, leaving openings for camera extension and ruby glass. The cross rails serve a double purpose. They stiffen the frame and furnish a substantial outline for the extension-box of the camera, which is screwed to the frame through the inside of the box, and then the edges are chamfered so as not to obstruct light. A slit in the top of the box receives the negative carrier, which is made of a 5 x 7 kit with a 4 x 5 opening. To the left of the camera a cardboard slide, moving up or down, covers the ruby glass when such is required—as in the case of plates. On this slide a piece of wood is screwed, serving as a handle and easily located in the dark.

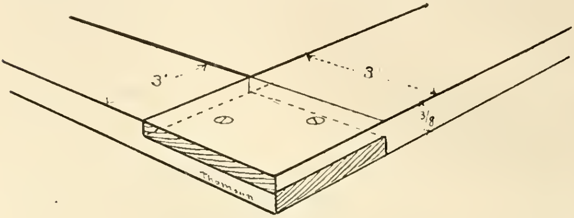
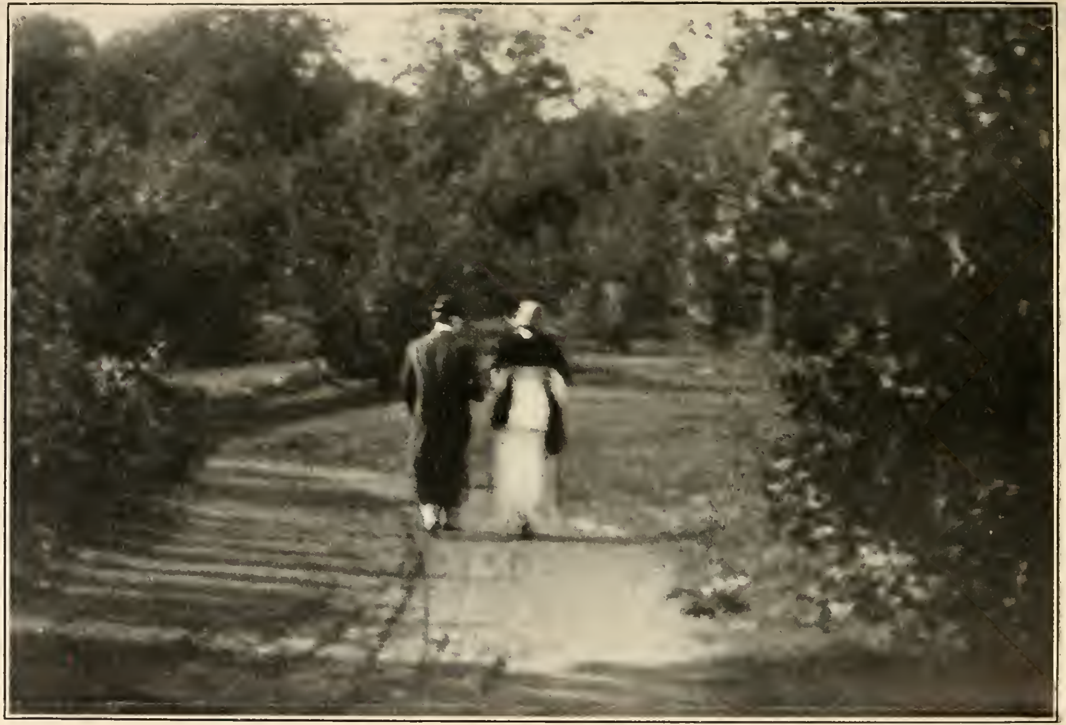


Fig. H

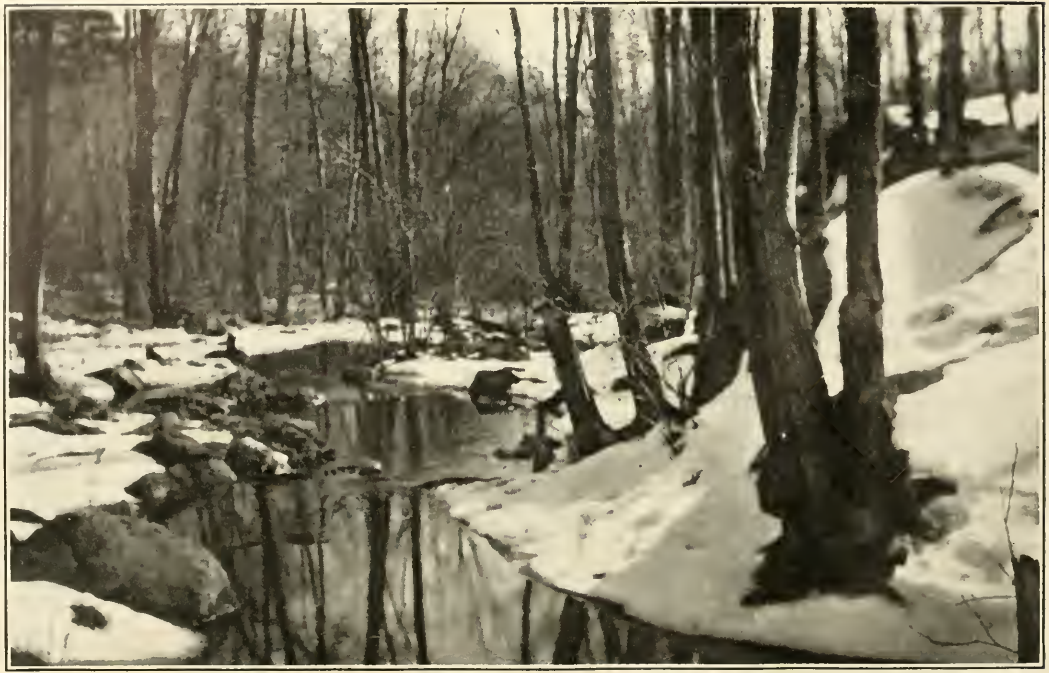
The equipment is removable. When not in use, it is kept in an adjoining closet. It takes but five minutes to set it up and less to remove it. The lower sash of the window is raised, the framework then being pressed into the space reserved for it. Weather-strips serve to keep out light around the edges. The frame is much easier handled when made in two parts coincident with the sashes of the window. In that case, the upper section is first put in place, to be quickly followed by the lower. A strip of wood nailed to the lower frame over the joining serves to keep out light, and, when all is held in place with push-pins, helps to hold all secure. The depth in the wooden extension-box from the back of the camera to the negative is 6½ inches. All woodwork outside of the negative carrier should be white-painted; all inside of same, stained black. All sharp edges outside of the negative kit liable to obstruct light should be beveled before painting.

The Easel A board conforming to the size of the largest enlargement likely to be required should be provided. A drawing-board answers best because made of pine and flush cleated.



"When you and I were young." James Thomson

5 x 5-inch enlargement from hand camera negative



Late Afternoon: James Thomson

5 x 7-inch enlargement from a pocket camera picture

The long board upon which the easel slides may well be 10 inches wide, 5 or 6 feet long and ⅞ of an inch thick. It should be accurately planed top, bottom and sides, and should be of even width and thickness, to the end that the easel may slide back and forth without hitch or hindrance. While not essential, it is a good plan to cover the face of the easel with cork linoleum, into which pins (which should be of the toilet, glass-headed variety) will stick readily. Some sort of catch should be attached to the easel to hold it firm once it is placed.

A well-made and thoroughly satisfactory easel, available at a moderate price, is the Prize Enlarging Easel, which has a folding base and is equipped with adjustable paper-holders for any size of enlargement up to 16 x 20 inches.

The Reflector In most cases a reflector is needed, but not always, when the negative is pointed upward. In rare cases the reflector is a framed mirror, placed at the proper angle to reflect the sky; but more often it is a board, white-painted or covered with white paper, and where small negatives are employed frequently, but a simple white card.

We are usually instructed to place the reflector at an angle of 40°, an error which I quickly discoverd when, on looking down into a mirror so placed, I beheld not clear sky but the overhanging cornice of the building. The angle at which the reflector should be placed, therefore, depends upon that which comes immediately over it. Make certain of reflection from a clear sky, then place the reflector. My personal idea of a reflector is not the customary one in which a board with a sheet of white paper to cover it is utilized. I advise a thin frame of spruce or pine the full width between the window-casing. Such a frame is light in weight, and when covered with white enamel cloth reflects light perfectly. Hinge at the bottom to a strip of wood the same in length as the reflector. This strip can then be attached (permanently or not, just as circumstances dictate) by screwing to the outside window-sill. Bring to the proper angle and fasten to the window-casing with chain and screw eyes. See detail sketch in Plate 5.

Focusing the Image

Assuming that the negative is in the kit (Figure F), and the latter in position in the extension-box, *film side inward*, set the largest available opening in the camera lens. Get a sharp image upon a sheet of white paper framed upon the easel, by moving the camera-draw in or out, by shifting the easel, or by both movements combined. Use, if needs be, for the time being a good sharp negative, and, for large dimensions, a large reading-glass will be a great aid in this detail.

Exposure

Once a sharp image is obtained, expose a strip of sensitive paper so as to cover a high light and a deep shadow. The necessary exposure being now determined, we may next reduce the size of the lens-stop before exposing for the full-size sheet. The shutter is now closed, a sheet of sensitive paper pinned to the board in place of the other, and the exposure effected in accordance with what was learned in that regard from the trial slip, which, meanwhile, has been developed and passed for a minute through the fixing-bath.

It is a saving of time to test the light with the full opening, then for the exposure (if need be) to stop down to a smaller aperture. Say we determine

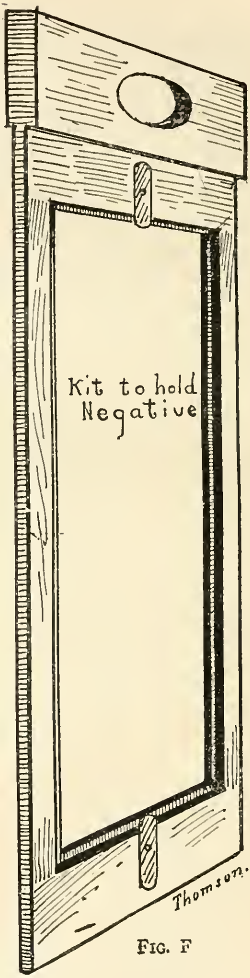


FIG. F

exposure with f/8. We then for the large sheet reduce the stop to f/11 and double the exposure time, or use f/16 and multiply by four.

Once focusing is done for the various regular sizes, there is no need to repeat. Mark results on the board and make a note on a handy sheet of paper as regards position of the camera-draw. All one has to do under such conditions, when a regular-size enlargement is required, is to consult the figures, make the necessary adjustments and proceed to expose, with the certainty that the image will be sharply focused.

Learn to count seconds, or consult a small clock. With so moderate a priced medium as gaslight paper, however, a second more or less of exposure, where average negatives are involved, is of trifling moment.

It is a good plan in daylight exposures to operate always under the same conditions. Work only in sunshiny weather and between the hours of 10 and 3.

Extension Box

The depth required for the extension-box is governed by the focal length of lens and the dimensions of enlargement likely to be required. As may be seen by reference to the table of distances from lens to negative given herewith, it is only when small enlargements are in order that a deep box is necessary, in which case the longer the focus of the lens employed, the deeper the extension. We can easily keep down the depth of the box by substituting, when necessary, a supplementary lens, to shorten the focus. Any simple magnifier will serve. If only large prints are wanted, a mere frame to form a rebate to take the rear of the camera will be sufficient when a lens of 5- or 5½-inch focus is involved.

Distance from Lens to Negative

Focus of Lens	Enlargement Same Size	Enlargement Double	Enlargement Triple
5-inch	10-inch	7½-inch	6¾-inch
5½-inch	11-inch	8¾-inch	7¾-inch
6-inch	12-inch	9 -inch	8 -inch
7-inch	14-inch	10½-inch	9⅓-inch

The Lens Any lens that will take photographs in the customary fashion will answer for making enlargements. The better the lens, however, in covering power at a large opening, the more satisfactory it will be both as regards the quality of the resultant image and celerity in obtaining results. Most photographers in time accumulate odd lenses, the salvage of discarded or broken-down instruments. If the reader is the possessor of such a discarded lens, and it be of the rapid-rectilinear type, it will come in handy for the enlarging equipment. If the owner of more than one, an extra one can be profitably employed in a camera of the fixed focus variety, taking say 6½ x 8½-inch enlargements. Where there is a collection of old lenses, fresh arrangement of positive and negative elements may be easily effected, in order to conform with focal requirements of enlarging apparatus. For enlarging purposes, the minimum focus should equal the base line of the largest negative to be used, while the maximum need not much exceed the diagonal.

The longer the focus of a lens, of course, the better the marginal definition, but the greater the time required to make the enlargement. It may be all right to employ a long-focus lens where one has a strong artificial light and a large pair of condensers. The majority of workers have cameras fitted with lenses of short- or medium-focal capacity, and such cameras are readily adaptable to enlarging, either with day or artificial illumination.

The Anastigmat Let us consider the anastigmat lens in a class separate from the others. With it as an enlarging objective, we need not resort to the small stop in order to get flatness of field. With the average achromatic lens, it is necessary to stop down to, say *f*/11 (No. 8). For outdoor work the working aperture of a high-grade rapid rectilinear lens is *f*/8, and of the cheaper sort *f*/11; but, in order to get sharpness at the corners when using such lenses for enlarging, we must stop down a little, save in large enlargements, where breadth and atmosphere are desirable.

The achromatic meniscus lens can be used at *f*/12 outdoors, but for enlarging it is necessary to stop down to *f*/22. As regards the anachromatic lens, such as a

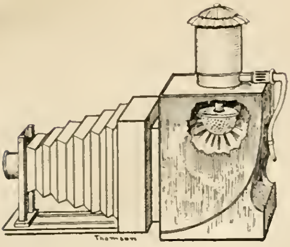


Fig. D

2-inch reading glass; very good enlargements can be made with it if we stop down to $f/32$, and sacrifice a trifle of the image from the margin of the negative.

Using Artifical Light

Passing from day to artifical lighting, let us consider the needs of the average worker who cannot avail himself of daylight apparatus, and would fain make enlargements at night. Figure B shows a moderate-priced lantern wherewith one's own camera may be so utilized. (Geo. Murphy, Inc., New York.) Figure A shows an English model for use with one's own camera. Figure D is another English model which converts a daylight enlarging camera into an enlarging lamp. In Figure I is shown a home-made lamp constructed on the same

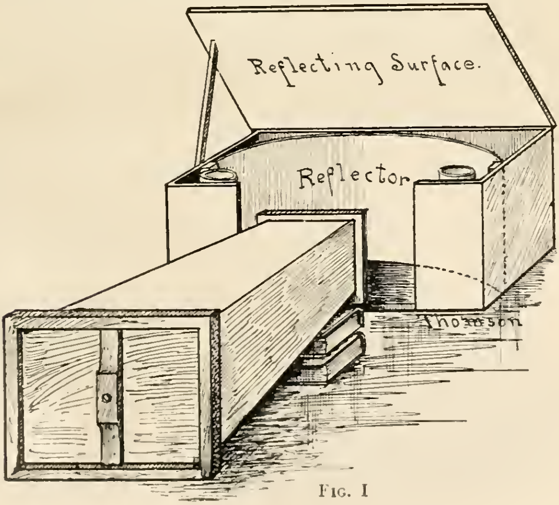


Fig. I

principle, with which such portable enlarging cameras as the Thomson No. 1 and No. 2 can be converted into night-working instruments. The illuminant can be gas, electric light, or magnesium ribbon, while a sheet of burnished tin forms the reflector. Any ordinary camera can be utilized to make enlargements by this method, the image being then thrown upon a screen which may be an empty box set on end, as in Figure C.

A Simple Enlarger

Figure C depicts a simple, home-made lantern in which gas or electricity may be used. The body is but a Duryea starch-box, which has a sliding cover on it and which is here utilized for a door upon the side. A curved piece of burnished tin makes an efficient reflector. Nothing could be simpler and yet good work can be done with such an outfit, though personally I prefer a couple of incandescent gas burners instead of the one electric bulb.

Gray's Parallax Lamp

A new enlarging lamp well worthy of the attention of the reader is the Parallax Lamp, recently introduced by R. D. Gray, Ridgewood, N. J. This consists essentially of an incandescent electric bulb surrounded by thirty glass mirrors. Each mirror throws an image of the bulb forward, where they are bunched in a solid blaze of light, which passes through the full diameter of the reflector, the actual working power of the bulb being thus increased 3,000 per cent. With this light and Artura Carbon Black paper, an enlargement of 2 diameters can be obtained in 10 seconds; with Cyko Soft, in 90 seconds, with Azo Soft, in 3 minutes. The possibilities of this lamp can best be appreciated by a careful reading of the information sent out by the manufacturer of the lamp, to which the reader is referred.

Brownie Illuminator

For the amateur who has heretofore been obliged to confine his enlarging efforts with the Brownie Enlarging Camera to day operation, there has been lately placed upon the market the Brownie Enlarging Camera Illuminator, with which enlargements can be made in an ordinary room, as is the case with the Velox contact print. The light is electric, and all open-back small cameras are adaptable to the illuminator. Where the camera has an

R. R. lens, the exposure can be confined within reasonsonable limits; but with the single lens I fear my patience would be severely tested, save with bromide paper as a medium.

Many would-be enlargers have been deterred from using artificially illuminated systems because of the supposed need of expensive condensers. There are, however, a number of forms of enlarging apparatus where no condensers are required. The Graphic Enlarging and Reducing Camera is operated either by day or by artificial light without the use of condensers.

Working with a Condenser

Enlarging apparatus artificially illuminated, as a rule, is worked with a condensing system, consisting of a couple of plain-convex lenses. In regard to the position of such lenses, Dr. John Nicol says: "The source of light should be placed at the focus of the condensers, in order to send out parallel rays after passing through the lenses. The negative is usually placed close to the condensers at the side opposite from the light. If a Welsbach burner be used, a piece of ground-glass should be placed between the condensers, else the outlines of the mantle will show in the enlargement." Mr. E. F. Keller separates the condensers a quarter of an inch by placing between them a piece of ground-glass. Another worker, using a 250-candle-power Tungsten light, instead of condensers, employs a corrugated mirror to reflect back the light. For large prints, however, made from 6½ x 8½ negatives, there are required 12-inch condensers. Under such conditions, the exposure on Royal Bromide paper is from 1 to 5 minutes, which would be equivalent to 10 to 50 minutes with Artura Carbon Black.

Regarding working with condensers, a writer in *The British Journal of Photography* says: "When the scale is varied, the distance from the lens to image and lens to negative is altered. Such changes are the only ones taken usually into account, but there are others that may affect the result severely. In the first place, if the alteration of the scale is considerable, the light has to be readjusted; it must be drawn back from the condensers if the scale is increased, and pushed nearer to it if the scale is reduced.'' In short, the condenser collects either less or more light, and the negative, therefore, is less strongly or more energetically illuminated, factors often overlooked in enlarging calculations, responsible for errors in exposure.

A Home-made Lantern

Figure E shows a home-made lantern constructed along the lines of one designed by Mr. E. J. Spooner. Anyone handy with tools could duplicate it. The dimensions, of necessity, depends on how large the negative is to be, which, again, determines the size of the condensers. Here they are 6 inches, the negative used being 3¼ x 4¼ inches.

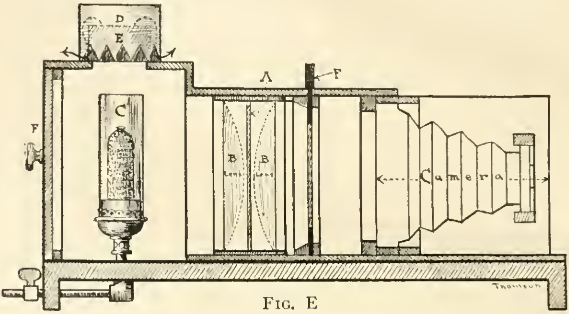


Fig. E

The body may be made of one-fourth-inch wood. *A* is the ground-glass; *BB* the condensers; *C* the Welsbach burner; *D* the outside tin chimney, that should have a top, which the inside one *E* must not; *F* is a hinged door in the rear of the box. A frame of one-fourth-inch wood, somewhat wider than the thickness of the two condensers when combined, is made to contain them, with the ground-glass between. The condensers should be a tight fit. The chimney can be made of a small can, with top and bottom knocked out of it. Over it is a larger can with a closed top. Smoke finds a vent through the small can, turns over the edge of it, and seeks an outlet through the ragged holes at the bottom of the outside tin.

Choice of Illuminant

The illuminant may be magnesium ribbon, electricity, gas, acetyline, gasolene vapor, kerosene vapor, alcohol vapor, a house-lamp burning kerosene, a bicycle lamp burning alcohol, lime-light, and the white light of day. The strength of light, however, introduces some new factors of which we must take note. The electric arc, for example, cannot be used where negatives are thin unless we interpose ground or yellow glass diffusing-screens. A short exposure to a strong light results in softness in the enlargement, a long exposure to a weak light gives vigor. To get a clear-cut, vigorous image, use a small lens aperture with a prolonged exposure. To get flatness and spreading of the light, use a large aperture, with proportional shortening of the exposure. Two common kerosene burners will make an enlargement excellently well if given time.

The value of the magnesium ribbon as an illuminant for enlarging has been overlooked. A study of it will well repay intending enlargers. Used in conjunction with a reflecting lamp, it is most useful.

Size of Enlargement

There is a fallacy abroad regarding the ratio in which the exposure must be varied for the different sizes of enlargement. Most workers are possessed of the idea that four times the size of the original (say 4 x 5 inches enlarged to 8 x 10 inches) will require four times the exposure needed for a copy same size. The following table from the *British Journal of Photography Almanac* is to correct that notion.

[This Table is carried over page, in order to present it as a whole.]

RELATIVE EXPOSURES FOR VARYING PROPORTIONS OF IMAGE TO THE ORIGINAL

(W. E. DEBENHAM'S TABLE)

To find the relative exposure, add one to the number of times that the length of the original is contained in the length of the image, and square the sum. This will give the figure found in the third column of the annexed table.

As examples: Suppose a copy is wanted having twice the linear dimensions of the original. Take the number 2, add 1 to it, and square the sum $3^2 = 9$. Again, if a copy is to be of eight times the linear dimensions of the original, take the number 8, add 1, and square the sum $9^2 = 81$. Copies respectively twice and eight times the size (linear) of the original will thus require relative exposures of 9 and 81—*i. e.*, the latter will require nine times the exposure of the former.

It is convenient to have a practical standard for unity. An image of the same size as the original is a familiar case. and serves as such standard. By dividing the figures in the third column by four, we get at the figures in the last column, which represent the exposure required for varying degrees of enlargement or reduction, compared with the exposure for a copy of the same size.

The table is carried up to enlargements of ten diameters.

Proportion of image to original (linear)	Distance of image from lens* in terms of principal focus	Proportionate exposures	Exposures proportioned to that required for copying same size
(Same size) 1	2	4	1
2	3	9	2.25
3	4	16	4
4	5	25	6.25
5	6	36	9
6	7	49	12.25
7	8	64	16
8	9	81	20.25
9	10	100	25
10	11	121	30.25

*With a double lens it is usually sufficient to measure from the position of the diaphragm plate.

Condition of the Negative

With gaslight paper almost any class of negative is suitable for enlarging; but the thinner the negative and stronger the light, the more care must be exercised. The glass side must be clean, and the film swabbed with a wad of absorbent cotton, especially in the case of a thin negative. Pinholes should be filled, even if not well done, because it is easier to "touch up" a white spot on a print than to get rid of a black one. The custom of working on tissue paper placed over the glass side of a negative must be eschewed in enlarging. Work with pencil or graphite is certain to show in the enlargement. Scratches may be filled with gum when on the glass side, and sometimes yellow wax will serve for those on the film. My own method of modifying a negative used in enlarging is through staining the film with transparent color. Lantern-slide colors may be used, though some are over penetrative; stain the part, and immediately swab with a wad of cotton wet with clear water. Repeat, if necessary, and where inadvertently overdone soak in water.

Use of Bolting Silk

Bolting silk is used by millers in sifting flour. There are six different qualities and at least 125 grades of fineness, while to the inch threads range from 18 to 180. Photographic supply houses, for obvious reasons, sell but three grades, all 40 inches wide, at from three to four dollars a yard. At first hand the silk sells at from $1.60 to $10 a yard.

The silk, in photographic practice, is useful in enlarging to break up blocked shadows. When there are shadows that are black and without detail in a print, by using the bolting cloth at varying distances, a softening takes place. While we cannot supply detail to the shadows, the use of bolting cloth in breaking up the deposit of silver supplies a substitute that will serve.

The best positions for the silk are one-fourth and one-half inch from the sensitive surface. Make a light frame one-half inch thick and stretch the silk upon it, glueing to keep it taut. Over the glued part nail strips one-fourth inch thick. Should a fine-mesh effect be wanted, press the one-eighth-inch side close against the paper during exposure. When a more diffused effect is desired, use the other side in like manner.

In this connection, the textile fabric known as chiffon is advocated by Cyril D. Morse, in a late paper in *Photography and Focus.* He places the fabric over the lens during the exposure, which softens the image and eliminates any wiry sharpness of outline due to excessive sharpness in focusing the original. Bolting silk is a costly material, while chiffon costs but a trifle, for the reason that no large piece is required, and it is, moreover, easily obtainable.

Light Control by Screens

On the side of the extension-box in the drawing showing the blocked window, will be noticed the yellow-glass. This glass is not ordinarily employed, but is useful when negatives are thin, or where the necessity for subduing the volume of illumination arises. It is not necessary that the glass be yellow, yet it must be kept in mind that yellow increases contrast, blue decreases it. Also we may substitute for the yellow screen one of ground-glass.

Using Portable Enlargers No. 1 and No. 2

Circumstances of necessity must govern the method of operating, but personally, in my work with the portable enlargers Nos. 1 and 2 illustrated herein, I work at a window facing the north, where there is an unobstructed view of the sky. The camera is inclined against the window-sill, the base resting upon a box. All shades are drawn, hence the light, while ample, is filtered and subdued. In an adjoining closet (really a 7 x 7-foot windowless room) are developing materials, and here in a darker corner are the packages of paper for the occasion to be used. Once correct exposure is known, a sheet of paper is attached to the exposure-board with small thumb-tacks, the slide inserted in the holder, the latter taken to the camera and slid into the place reserved for it, when a cloth is thrown over the negative. A clock being at hand, the slide is withdrawn, the cloth raised from the negative end, the seconds counted off, and the cloth quickly replaced again. The slide is returned to its place in the holder, the latter being then removed to the closet for development.

All this is effected in a room with plenty of light, but it is safe because filtered through brown Holland shades, there being three windows in the room. In such a light, of course, it is well to be careful, hence, in pinning the sensitive paper upon the exposure-board, and while developing, it has been my custom to place the bulk of my body between any direct light and the emulsionized surface.

Finding the Exposure

With so variable an illuminant as daylight, there is difficulty in determining the exposure. We may, however, do much to limit uncertainty. All negatives from which enlarging is to be done should be classified. Visual examination may, to some extent, decide when we separate the blue-black image from that which tends to yellow. Again, we may definitely standardize first our selection of negatives by making proof-deep prints from them on solio paper. If one negative requires but a minute to print, and another two minutes, it is plain that they must go into separate classes. This is a great help, whatever the quality of the light. In time, the worker can determine the printing qualities of a negative by holding it up to the light, and comparing the parts of greatest density with some other negative of which there is a record of exposure.

A Record of Results

It is an excellent plan to keep a record of enlarging experiences. From my first tentative efforts in this line to the present time, I have kept tab on my work by jotting down details. It is not necessary that all enlargements should be recorded, but, where there is required treatment differing from the normal, it is essential that some note of it be made for future reference. Where the exposure is determined through the use of an actinometer, we cannot get along without a record. The brand of paper and developer must be known, else the record of exposure for a given negative is useless. The form of record I use is given herewith. Note the relative speed of the brands of paper employed, and the influence of a strong solution of metol in shortening exposure.

A Record of Enlargements

Negative	Date 1910	Meter No.	Paper
A. & H. Artillery .	June 8	Tint No. 16	Argo Portrait
A. & H. Artillery .	June 8	Tint No. 16	Studio Cyko
A. & H. Artillery .	June 8	Tint No. 16	Profess. Cyko
A. & H. Artillery .	June 9	Tint No. 16	Argo Portrait
A. & H. Artillery .	June 9	Tint No. 16	Studio Cyko
A. & H. Artillery .	June 9	Tint No. 16	Profess. Cyko

Negative	Stop	Time	Developer, etc.
A. & H. Artillery .	f/16	36 sec.	Argo M. 2, 1 to 1
A. & H. Artillery .	f/16	25 sec.	Argo M. 2, 1 to 1
A. & H. Artillery .	f/16	3 min	Argo M. 2, 1 to 1
A. & H. Artillery .	f/16	30 sec.	Normal Metol
A. & H. Artillery .	f/16	22 sec.	Normal Metol
A. & H. Artillery .	f/16	120 sec.	Normal Metol

Actinometer reading, 10 A.M., June 8. 7, 11, 13. 14, 15, 16.
Actinometer reading, 10 A.M., June 9. 7, 10, 12, 14, 15, 16.
Enlargement distance 8 x 10. Portable Enlarger No. 1.

Instead of employing strips of paper to gage or make trials of exposure, we may use a graded screen or print-meter, such as the Wynne or Watkins meters, which will repay their first cost in the saving of waste of paper.

Personally, I at first used a graded or actinometer of my own devising, which lack of space prevents my describing here, but now depend wholly on visual examination of density and a test strip. If in doubt as to the facts, the record is consulted, and these are recorded exposures on similar negatives at the same time of previous years. For example, say exposure under similar conditions last year took 40 seconds, then for 40 seconds I expose a strip of paper. If, on development, it is a trifle over- or under-timed, I govern myself accordingly in exposing a full-size sheet. The fact of the matter is, gaslight paper has so much latitude, that, when using normal negatives, a few seconds additional makes but small difference. When there are whites in the composition, represented by black in the negative, we may very considerably over-expose without doing more than add to the contrast of the resultant print.

A Cyko Hint

Before this monograph was put into final shape, opportunity was accorded the manufacturers of gaslight papers to furnish such enlarging information as was theirs to record, as affecting their own particular product. The only definite information coming from that source came from the Ansco Company, the manufacturers of the Cyko paper.

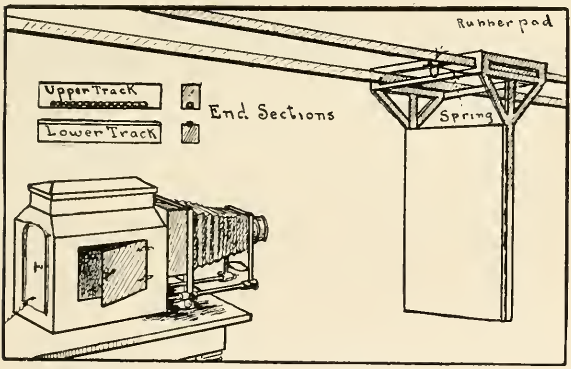


Fig. T

In Fig. T, we have a drawing of the outfit this company is using in the demonstration rooms of the Minneapolis branch of their business. The easel is supported by 2 x 4 joists, along which a metal track permits of its being moved backward and forward readily. While, once it stops, it is firmly held in place by a rubber pad, which is forcibly pressed down by a stout metallic spring. As may be disclosed by an examination of the details, there are ball-bearings, which are assurance of freedom from hitches when operating the easel.

There was used in experimentation an Ingento Enlarging Lantern (shown in the drawing), made by Burke and James, Chicago. This was fitted with 9½-inch condensers, a sheet of ground-glass being placed between the lenses to insure even lighting. The illuminant was a 90° hand-fed arc lamp, made by the McIntosh Stereopticon Company. The advantage of this form of arc light is that the rays of light emanate from one point, hence the illumination is constant.

With this outfit, the exposure required for *soft Cyko* paper (red label) was ten seconds; whereas, with *Professional Cyko*, under like conditions, the exposure was fifty seconds, a normal negative being employed in the tests.

Lens Stops in Enlarging

When we come to enlarging, the actual efficiency of the "stop" is altered. When we say that we use stop 16 in making an enlarged picture, we but designate it so by custom. Thus to quote from the Wellington booklet: "Let us suppose that the stop in use is marked *f*/22, and that the distance from the diaphragm to the easel we find, on measurement, to be 35 inches. As *f*/22 has a diameter of $\frac{2}{11}$ of an inch, we divide 35 by $\frac{2}{11}$. That is to say, we multiply 35 by 11, which gives us 385, and divide this by 2, getting 192. So that, under these circumstances, we are using *f*/192 actually, although the stop is marked *f*/22."

I beg also to quote from Mr. Hilton Grundy, in 'Photography': "An example may make this clearer. A single standard exposure only is necessary, It will serve for years of work. An image was focused to be of the same size as the original (that is with a ratio of 1 to 1), with a 9-inch lens working at *f*/6. When "enlarging" some size, the distance of the sensitive paper from the lens is twice the normal focus of the latter. In this case, therefore, the paper was 18 inches from the lens, the stop marked *f*/6 was, for the time being, *f*/12. The correct exposure, therefore, was 20 seconds, with *f*/12. When the easel is moved so as to give an enlargement of one and a half times the original, the distance from the lens to the paper was by measurement found to be 22 inches. Since 22 is roughly two and a half times nine, we may take two and a half times six (that is to say 15) as the *f*/ number of the lens, under the new conditions. Every photographer knows that the exposure required with different stops is in proportion to the square of the *f*/ number. As 12 x 12 equals 144, and 15 x 15 equals 225, the 20-seconds exposure at *f*/12 becomes 20 x 225 divided by 144 at *f*/15, which works out approximately at 32 seconds.

Another enlargement twice the size of the original was made. The distance of the lens from the paper was 27 inches; therefore, if *f*/12 requires 20 seconds exposure, *f*/18 requires two and a fourth times as long, that is to say 45 seconds.

These different exposures proved in practice to be quite correct in each case. All the record that the photographer need keep for future reference might be thus expressed: Standard negatives at *f*/12 require 20 seconds. Nothing more than that."

Comparative Speed of Papers

How do the fast brands of gaslight paper compare with bromide paper, as regards sensitiveness? In my experience Artura Carbon Black, the speediest of the gaslight class, is ten times slower than fast, and six times slower than medium-fast Eastman Bromide paper; while Normal Cyko and Special Velox are half as fast as the Artura.

In order that the relative speed of the papers that are herein recommended for enlarging might be more definitely established, careful tests were made, both in the enlarging apparatus and through printing under a graded screen providing forty grades of opacity. Each sheet of paper was exposed for the same length of time at the same distance from an oil burner (Rayo lamp). All were developed simultaneously in strong metol. The results are tabulated below, and indicate the highest opacity registered upon the screen in a given time.

Artura Carbon Black, 22; Wellington S. C. P. De Luxe Art Carbon and Art Soft, 20; Soft Cyko, 16; Normal Cyko, 10; Wellington Slow, S. C. P., 13; Velox, 9; which simply means that when Artura has reached the twenty-second mile stone and is resting, Velox is still at the ninth, though eventually it will reach the tenth, and hence be equal to Normal Cyko in number of possible gradations with that particular developer. For the pictorialist, therefore, there are but three grades of paper wherewith to register all fine gradation in his negative, outside of Argo Special Portrait. The steep gradation steps of Normal Cyko, Special Velox, and Argo Portrait dictate, for enlarging, a soft negative, otherwise the result will be somewhat contrasty. On the other hand, where brilliant results are required, the slow papers are the brands to employ. For practical purposes and ignoring fractions, I should, therefore, place the speed of the various papers approximately as follows: Eastman Bromide Paper, medium speed, 24; Artura Carbon Black, 4; Wellington Soft Art and Soft Carbon, 4; Soft Cyko, 3; Normal Cyko, 2; Special Velox, 2; Wellington Slow, 2½; 24 being the maximum speed number employed in calculations.

Typical Exposures

Employing a normal negative, having a full range of gradations from black velvet to absolute white, but nevertheless thin, the record is as follows: June 30, 1909; military parade; 8 x 10 inches; sunny; 18 seconds *f*/11; Argo Portrait; Argo M-Q developer, 1 to 1. August 9, 1909; same negative; 6½ x 8½ inches; sunny, with haze; 35 seconds *f*/11; Argo Portrait; Argo M-Q developer, 1 to 2. September 1, 1909; same negative; sunny; 6½ x 8½ inches; 18 seconds *f*/11; Normal Cyko; Metol developer. September 13; same negative and conditions; 15 seconds *f*/11; Soft Cyko; Argo M-Q developer.

These enlargements were made with portable apparatus in which there is no diffusing screen. In fixed apparatus, there is usually required a ground-glass screen, which doubles the required exposure. The color of the negative also has great influence. Pyro-developed negatives sometimes require just double the exposure of those developed with M-Q. For rapid work, therefore, blue-black, brown-black, and gray-black negatives are to be preferred. Multiply by 4 the foregoing exposures when made in midwinter.

As regards exposures made with a fixed-focus style of enlarger fitted with a single lens, exposures in midsummer run from 2 to 10 minutes, and in midwinter from 8 to 30 minutes. When fitted with an R.R. lens the exposure on Artura Carbon Black paper in July was as short as 12 seconds, the development being with strong Metol.

Variations

It should not be overlooked that the exposure times quoted in the foregoing are subject to material increase when the negative is contrasty, yellow-stained, or overdeveloped. There are workers who carry development far beyond requirements, while others, again, are dependent on commercial practitioners who turn out products of the "chalk-and-charcoal" order. In regular camera practice, the rule is to expose for the shadows; whereas, with enlarging, it is to expose for the highlights. When there is a patch of pure white in a composition, we must needs keep on exposing until such time as the light has forced its way through, regardless of the fact that all other portions have had their due allotment of exposure. As an example of enlarging from such a type of negative., we may take a snow scene. With Artura and *f*/16, an 8 x 10-inch enlargement in April required 60 seconds. Again, there has been times when with, the portable enlarger, the same work has been done in 30 seconds. In midwinter enlargements on a slow medium, such as Portrait Argo, have taken as long as 30 minutes in the fixed apparatus.

Development

To develop enlargements, the M-Q. formula recommended by the manufacturers of the different papers may be relied upon to give normal effects. There must, however, be some modification therein to offset the tendency to increase contrast from spreading of the light. Nor are all the desirable effects of the normal order, these tending, as a rule, to brilliancy rather than delicacy, and not all workers wish to sacrifice the latter quality. We must therefore use the developer that best conforms with purpose and ideal, which can be readily done where judgment is used in selection.

For enlarging purposes, the regular formula must be made to have less speed, especially where large sheets of paper are involved. It is one thing to handle a 4x5 with the usual "develop-in-thirty-seconds" solution, and quite another where the 16x20, or larger, is concerned. In order that enough time be accorded to handle large prints to advantage, the regular developer should be diluted with an equal volume of water. This is one way. A better plan is to reduce the amount of alkali, or substitute one less energetic in action.

Modifying a Developer The generality of workers are concerned more with vigor than they are with tonal quality. Give the average amateur contrasty prints and satisfied he is likely to be, notwithstanding there has been a sacrifice in values. The lover of so-called "snap" and "vigor" can easily obtain his desires by availing himself of the customary M-Q developer of the paper-maker, which, as a rule, is made up with that one object in view.

Influence of Exposure on Development Exposure time depends on the strength of the developer. Do not lose sight of this important fact. When the developing agent is strong, the exposure must be short, and *vice versa.*

For soft effects, give as short an exposure as can be relied upon to impress the most delicate portions of the image and develop in strong metal. For brilliancy give a long exposure and develop in the M-Q developer of the paper-manufacturer, dilute with an equal volume of water and enough bromide to preserve the whites and blacks.

Short exposure and development in normal M-Q developer results in blue-black tones.

Long exposure and development in the same developer, diluted with an equal quantity of water, results in warm black tones.

Extreme exposure and development in dilute developer (1 to 4 or 5 or 6), well restrained with bromide, results in effects all the way from mouse-color to sepia of an olive-green hue.

Some of the out-of-ordinary effects are very artistic, but not such as appeals to average amateur taste, where absolute black is still favorite. By careful experimenting with the different variations possible in exposure and development many desirable effects may be secured.

To Get Softness

(1) Give as short an exposure as possible, and develop in strong metol. (2) Reduce the quantity of carbonate of soda in making up the developer, or substitute for it in part the bi-carbonate of soda. (3) Use as small an amount of bromide of potassium as is consistent with the preservation of the whites. (4) Use Rodinal as a developer, with which no alkali is necessary. (5) Add to each ounce of regular developer half a grain of iodide of potassium to keep the print clear.

To Get Contrast

(1) Use carbonate of potassium instead of carbonate of soda. (2) Increase the exposure and dilute the developer, adding bromide enough to preserve the tone of the blacks. (3) Substitute a harder working developing agent, such as hydroquinone or glycin.

Developers Compared

It is false economy to be economical with developer, or to begrudge the cost of the best, though what is best is a matter of personal opinion. M-Q developer suits the majority of workers, and is inexpensive. Metol is best where softness is desirable. Eikonogen, combined with a small quantity of hydro-quinone, is cheap and good, the image tending to warmth in the blacks. Even our old friend pyro gives satisfaction when combined with metol or hydro-quinone. Metol, when made up with a large quantity of sulphite of soda, has excellent keeping qualities. Furthermore, with metol the sulphite acts not only as a preservative, but also as an accelerator. Developing action is possible with the sulphite alone, the carbonate of soda being added to hasten development and give body to the image.

Keep the Developer Constant

As a rule, the plan of working with developer that is constant is best where conventional effects are desired. Keep the developer constant, and use different grades of paper when more or less contrast is desired. Unless this is done, it will be necessary to keep a record, in order to avoid confusion. Enough bromide should be used to insure purity of the whites. If too little is used, the color is bad, and to the uninitiated the paper may seem to be defective. Add bromide a drop at a time, if necessary, until at the end of fifty seconds the whites continue to be pure. The precise amount of bromide cannot be determined beforehand.

Abrasion Marks

Abrasion marks are a trouble in the case of glossy papers. They can be removed by rubbing with a wad of absorbent cotton wet with alcohol. They can also be prevented by the addition of a grain of iodide of potassium to each ounce of developer, but this chemical has a reducing action, hence should not be used save with contrasty prints. *Delicate gradation is in danger of obliteration when this chemical is employed in excess.*

Developer Formulæ

The following variations from regular developer formulæ have been found useful: Water, 16 ounces; metol, 75 grains; sulphite of soda (dry), 480 grains; carbonate of soda (dry), 120 grains; bromide of potass. 10 grains. *Hydro-metol.* Water, 16 ounces; metol, 15 grains; hydroquinone, 30 grains; sulphite of soda (dry), 180 grains; carbonate of soda (dry), 100 grains; bromide of potass. 15 grains. Dilute with an equal quantity of water before use. *Eikonogen-Hydroquinone*, giving warm black tones. Water, 16 ounces; sulphite of soda (dry), 480 grains; carbonate of soda (dry), 150 grains; hydroquinone, 10 grains; eikonogen, 10 grains; carbonate of soda, 240 grains; bromide of potassium, 5 grains. For Artura Carbon Black, dilute with an equal volumne of water. *Dianol.* Water, 32 ounces; sulphite of soda, 480 grains. At the time of developing add the dry dianol powder in quantity to suit. For soft effects, I use 8 grains to each 4 ounces of sulphite of soda solution. Bromide of potass can be added as needed. The dianol developer has been found of great usefulness when employed in this manner.

A developer giving warm blacks is as follows. *A.* Water, 10 ounces; Pyro, 220 grains; sulphite of soda (dry), 1½ ounces; hydroquinone, 20 grains; citric acid, 60 grains; bromide of ammonia, 60 grains. *B.* Water, 10 ounces; carbonate of soda, 240 grains; sulphite of soda, 480 grains; bromide of potassium, 60 grains. Double the known normal exposure, and to develop take of *A*, 30 minums; *B*, 30 minums; and water, 4 ounces.

The regular metol developer is better for a trifling amount of hydro-quinone, in order to give body to the blacks and improve the tone. Add from 10 to 60 drops of any regular gaslight paper M-Q developer to each ounce of the metol formula used.

Working Notes Enlargements greater in size than 8 x 10 should have a preliminary wetting in clear water before immersing in the developer to avoid staining.

Yellow stains are caused usually by under-exposing and then forcing development; by letting the acid hypo become alkaline; by removing prints unnecessarily from the developer, so that the air gets at the emulsion; and by uncovered film while in the wash-water.

Prints that are slightly over-exposed can be easily cleaned up if care be used not to carry action too far. Throw some hypo into a tray of water and bring to a pale lemon color by passing a crystal of fine cyanide of potassium (red prussiate) through it. Before attempting to lay hands on the print, make certain they are free from the chemical. *Wash the hands in clear water.* Immerse the print and watch the reduction, and before it has gone too far remove and wash in running water.

Prints that are gray, flat, or mealy-looking, from over-exposure, may be improved by intensification with metol. First bleach the print in water, 10 ounces; bichloride of mercury, 60 grains; bromide of potass. 60 grains. After bleaching, wash for half an hour (success depends on this washing). Then redevelop in water, 10 ounces; sulphite of soda, 300 grains; metol, 20 grains. Complete by washing half an hour.

Greater contrast may be had by increasing the quantity of metol. The great advantage of this method, especially under hot weather conditions, is the elimination of all danger of film-softening with an alkali.

As in contact work in enlarging, three trays are necessary. They may be arranged somewhat as follows: Developer on the left, clear water in the middle, and acid hypo on the right. Also there should be at hand a long towel, conveniently hung so as to be within easy reach. A second cloth or towel is also useful to wipe up chemicals that overflow.

Developing Method

Immerse the exposed sheet of paper *face down* in the solution, immediately drawing it once or twice across the edge of the tray, and returning it to the solution *face up*, when it may be swabbed with a wad of cotton and the tray rocked. When development is complete, rinse the print in water and transfer to the hypo, where it should remain at least ten minutes. Very long soaking in a fresh acid-hypo bath has a tendency to bleach.

A correctly exposed enlargement will develop slowly, the image gradually showing until a certain point is reached when there is a pause. Leave for a few seconds longer, so that the blacks shall be rich. It is only the over-exposed print that flashes up in an instant, and then finishes with degraded whites. The whites in the correctly exposed print will be pure. If the portions of the paper that have been shielded by the pins remain white, and the "whites" of the image are gray, there evidently has been over-exposure. If all the whites are gray, the paper is, from some cause, fogged.

A print may be over-exposed to some extent, as may be seen by the way it quickly blackens in the developer. In such case, we may save an enlargement by as quickly as possible snatching it from the developer and, without washing, plunging it into the acid hypo.

While the correctly exposed enlargement has pure whites, these whites quickly change to a yellow if left too long in the developer, for which there is no remedy but sepia toning.

Washing

After fixing in the hypo bath advised for the paper in use, wash the prints in running water for an hour and be sure to keep them submerged for the first fifteen minutes. To permit gaslight prints to float film side up on the surface of the wash water is to invite disaster. Staining is also liable when enlargements are taken from the developer and held *too long* in the hands before immersing them in the fixing bath.

Do not allow the water to run in a stream directly on the emulsion side of enlargements. In summer, especially, this is a frequent cause of blistering. Whatever the receptacle used for washing, the stream of water should be led down to the bottom in some way. Personally, I use a footbath tub placed in the regular tub, a wooden gutter leading from the supply faucet, carrying the water in a continuous stream to the edge, where a cloth partly dams the flow, and the end of the cloth carries the water under. In this way the water is kept from the emulsion side, save such as surrounds the print. This method serves for prints up to 10 x 12 inches, and for large prints a frame covered with netting, some 3 inches in height, is placed in the regular bathtub. It may extend the entire length. The outlet for the water is partly dammed with a cloth, and a tube leading from the faucet carrys the water down to the bottom and under the netting. In this way there is a continuous flow of water, while the depth over the netting is subject to regulation by increase or decrease of the damming feature of the operation.

Blisters

Blistering of the film is a fruitful source of trouble. Even after using the acid hypo bath with some brands of paper, they persist. Do not develop in a warm developer, and immediately after fix in a freshly made hypo solution. Have all solutions of even temperature. At the first signs of a blister, take the prints from the wash water and immerse them in a tray of alcohol. Wood alcohol, I presume, would answer, and, in any event, it can be kept for that special purpose and be used over and over. After five minutes in the alcohol, return the enlargement to the wash water, when there should be no more trouble.

JAMES THOMSON.

Notes and Comment

Few conveniences are so generally used in photographic work, and yet so rarely mentioned, as good, absorbent, non-linting blotting paper. It would be difficult to keep house without this modern product, which has so much to do with the comfort of working and the quality of the final result in so many photographic processes. Some photographers are under the delusion that almost anything with the name of a non-linting blotter will serve the purpose. But the intelligent worker knows that the best in this is the cheapest. I can thoroughly recommend the "Photo Finish World" as a reliable blotter at a reasonable price, which will give good service. It is made by The Albemarle Paper Mfg. Co., of Richmond, Virginia, and is carried by most dealers throughout the country.

The success of the Victor Portable Stereopticon, which embodies entirely new principles in lantern-slide projection, gives much interest to the announcement that the Victor Animatograph Co., Davenport, Iowa, who make this instrument, are about to put on the market a new enlarging apparatus with special features of convenience and efficiency. Those who are planning for an enlarging outfit should write to this firm for particulars of their enlarging outfit.

An entirely new scheme of photographic coloring is embodied in the use of Assur Colors, introduced by Schering & Glatz, 152 Maiden Lane, New York. Those who appreciate the charm of color, and would like to learn how to color their prints in a very simple and pleasing way, should write this firm for a copy of the Assur booklet.

Everybody appreciates the simplicity and convenience of the glass tube as used for the packing of made-up developers, intensifiers and the like. But this convenience is often deceptive. Corks are obstreperous and sometimes require a complete tool equipment to remove them; and, after that, some chemicals will persist in staying within the tube until forcibly loosened with a knife. The perfect tube (it is worth while remembering) is the new "Agfa" M-Q Developer Tube, the inside of which is coated with collodion, so that the chemicals slide out like sand; while the ends are perfectly sealed with thin, soft lead, so that a touch of the finger-nail will open the tube. Ask your dealer to show you the new Agfa tube, or send 5 cents to the Berlin Aniline Works, 213 Water Street, New York, for a sample tube and the booklet titled "The Agfa Way."

Whether it is better and cheaper, in the end, to make one's own enlarging equipment, or to buy a reliable outfit for the work, is a question which everyone must decide for himself. Those who want to make their own apparatus will find ample encouragement in the instructions given by Mr. James Thomson in this issue of THE PHOTO-MINIATURE. But I confess that, as a busy man, I much prefer to go out into the market and buy the fruit of other people's labor, when it comes to putting things together.

There is an abundance of enlarging apparatus on the market at every desirable price. For years I have had lots of satisfaction out of the use of the Soldak Camera (G. Gennert, New York). This well-known enlarging camera has recently been much improved, and its operation is exceedingly simple. It is provided with a number of labor-saving conveniences. A descriptive booklet can be obtained from the maker, on request.

Telephotography is again coming to the forefront of interest. The new book on the subject by Mr. C. F. Lan-Davis has doubtless helped in this revival of interest. The reader who wants to double his camera pleasures during the forthcoming season should look into the possibilities of telephotography. A simple way of doing this is to send to Burke & James, Inc., 240 East Ontario St., Chicago, Ill., for their literature on the use of the Dallmeyer Adon Telephotographic Lenses and attachments.

The reticence of makers of development papers about the use of these papers for enlarging is "one of the things no man can understand." Just as we go to press, we are advised that many professional enlarging houses are using Chloralla (contrast) with much success for this purpose. The paper is said to give crisp and pleasing enlargements, with the qualities peculiar to the good-contact print. Chloralla is made by G. Gennert, New York, who will be glad to send samples of the paper to those interested.

Snapshot of Mrs. Hetty Green, the richest woman in America
(Photograph: Courtesy of S. H. Horgan, who is shown at right)

163.

The Photo-Miniature
A Magazine of Photographic Information
EDITED BY JOHN A. TENNANT

Volume XI MARCH, 1913 Number 124

Photography for the Press

Tempora mutantur et nos mutamus in illis. So runs the old Latin saying: "The times change, and we with them." A decade of years ago I persuaded Mr. C. H. Claudy to write for this series a handbook to "Press Photography," and he did his work bravely and well. But the amateur of that day was in photography for the fun of the thing, so to speak, rather than for money-making, and Mr. Claudy's enthusiastic suggestions fell upon unheeding ears, passing anon out of print and out of mind. The zeitgeist, however, has changed men's minds in this as in some other things. The great world which buys and reads calls for pictures, and more pictures; and the men who make the papers and books are seeking pictures of everything upon the earth, under the earth and above the earth, to satisfy this world-wide demand. Thus the amateur photographer, whose name is Legion, finds himself surrounded by a world market offering money with open hands for every sort of pictorial material his camera can provide. The metropolitan paper must have its weekly "art supplement," as well as news pictures for its daily editions. The "patent inside" of even the smallest country weekly must be lavishly illustrated. The magazines must be picture-books from cover to cover or they will not sell. The news-stands are the people's picture galleries. The children's schoolbooks are all abloom with photographs in black and white and color, and even the driest of government reports is sprinkled with photographs showing the how and why. In short, the world is being turned inside out in order to provide the illustrations needed for every sort of printed matter, and "cash and the camera" has become an overworked slogan.

The Incentive As examples, we have here a great daily paper, and there a wide awake manufacturer, offering $5,000 (£1,000) for a few photographs, such as any amateur might produce with his hand-camera while on holiday. Similarly, we have an authority in the moving-picture world estimating that, here in America alone, we are spending $500,000 a day to see the pictures in our 20,000 "movie" theaters. The plain fact is that the demand for illustration material is unending, and the supply unequal to the demand in quantity and quality. The instantaneous success of Mr. Waldon Fawcett's "Marketing Photographs for Publication," published in this series a few months ago, shows that the amateur of today is keenly alive to the profitable possibilities of this field of photographic illustration. Herein we are going to learn how and what to photograph for the world's illustrated press, just as in No. 120 Mr. Fawcett told us how and where to sell our prints.

The Field No other field or special branch of photography offers so wide a range of interest, or is, at the same time, so remunerative, as that opened up by the supplying of photographs for publication. The professional in his studio, the specialist giving all his time and skill to the work, the amateur with his pocket-camera, the dilettante and slow-working pictorialist, can all find in this single field abundant incentive and reward for the best they can do. Not only the newspapers and periodicals, but the publishers of books covering the illimitable fields of fact and fiction; the great firms turning out millions of post-cards and so-called art studies; and the writers of advertising matter in all its varied forms; all seek the right sort of illustration material as the very stuff of their existence. This material is all around us, as plentiful in the home or on the farm as it is in the busy city streets and metropolitan museums. On my table, as I write, there is a government publication illustrated with over three hundred photographs of snow and frost crystals; a reprint de luxe of Shelley's "The Cloud," with seven or eight fine platinum photographs of cloud forms; half a dozen booklets on England's Playgrounds, teeming with photographs of beauty spots reached by a great English railroad; a brochure of a hundred pages, illustrating the chief industries and interesting features of Philadelphia; a photograph of ten rabbits in a row, the work of an amateur's noontime leisure, of which twelve thousand copies have been sold by art stores; a book on baseball, with fifty pictures of players and the points of the game; and a chance snapshot of a merry little girl, which brought the maker of the picture $50 at sight, and was afterward used as a successful poster in an edition of a quarter of a million copies, with proper credit to the photographer. One can only indicate a few of the thousands of opportunities. And the camera is the true philosopher's stone which will transmute this rough material into gold. The market is eager and willing to pay for the right sort of stuff, but knows what it wants, and will buy nothing else. There must be work and method in the work before the photographic illustrator can hope for success.

Essentials

The requirements of the field are well within the capacities of even the beginner in photography, viz.: The ability to make thoroughly good negatives and prints; a thoroughly trained ability to recognize the special interest or news value of an available subject; and a methodical, intelligent plan for reaching the market where his prints will find acceptance. The man or woman who can meet these requirements should be fairly successful from the start, and will quickly open up new avenues of special work and profit, either by securing assignments from editors along particular lines, or in taking up specialties in a speculative way.

A Typical Sunday Newspaper

To see how large a part photography plays in the making of a modern newspaper, as well as to note the sort of subjects editors seek, it will be worth while to run over the pages of yesterday's Sunday "Sun." Here we have photographs of three young girls, showing how Greek dramas help in the development of physical beauty; a long line of prominent society people on a pleasure cruise up the Hudson; three prize-winning babies from the lower East Side of the city; twenty athletes in the sports section; a field view of the fourteen hundred runners who took part in a twelve-mile Marathon over a city avenue, with a detail picture of the winner receiving his reward; a page of debutantes and brides of the week; five examples of statuary from an exhibition by women sculptors; ten prominent singers in grand opera; eight notable players and details of current plays; seven private schools from nearby suburban towns; five American women presented during the week at the English court; the king and queen of the Belgians at an exhibition; a new snapshot of George V; Fontainebleau Palace and the French president; the Austrian fleet leaving for the Montenegrin Coast; views along a new Alpine railway; a page showing half a dozen of the old-time hotels of New York; a detail from an Amherst College students' play; five views of Montenegro's wild scenery; two pictures illustrating the art-craft of making flowers of iron; six views of an English polo club and its grounds; twelve youngsters grouped on a stone seat in one of the city parks; four pictures of scenes of revolutionary interest from a little Massachusetts town; eight views of a city sanitorium being built on Staten Island; a page of snapshots of the recent suffrage parade on Fifth Avenue; reproductions of three famous paintings in obscure French museums; a page of five pictures illustrating a boys'summer camp; fourteen famous vegetarians; three prints showing feats of horsemanship by members of a volunteer battery; three baseball scenes showing the work of women players of the great game; a new portrait of ex-President Taft as Law Professor at Yale University; an absorbingly interesting page of fashions from life; and a real-estate supplement crowded with houses built or building in New York's suburbs.

And its Lesson

Note from this catalogue how closely the editor of the city paper clings to the interests of today. More than half of the pictures here reproduced by the "Sun" are necessarily the work of professionals or "staff illustrators" sent out by the paper. But the opportunities for the outside illustrator, or amateur worker, are numerous enough to be encouraging, and a study of the papers will show these opportunities.

Illustrating Country Life

Let us look at the market somewhat in detail before going farther. Take first the world-wide movement condensed in the phrase, "back to the land," which has brought into existence so many papers and books devoted to the pleasure and profit of country or suburban life. Among all these papers, and the firms advertising in them, there is a constantly increasing demand for photographs of flowers, trees, shrubs, decorative natural forms, formal and informal gardens, park waters, country homes big and little, old houses "before and after," suburban pleasure spots, bungalow colonies, every form and aspect of country life activity and sports. The cultivation of fruits and crops, the breeding and care of dogs, fowl, cattle and farm stock generally. Pergolas, chimneys, gateways and approaches, lamp-posts and even mail-box pillars, all offer salable illustrative material, if they are made interesting and are offered at the right time and place. An hour or two spent with a file of "Country Life," "Suburban Life," or "The Country Gentleman" will suffice to show the reader some of the possibilities of this field and the wide variety of subjects used by editors and advertisers.

The Field of Travel

Similarly, the journals devoted to travel at home and abroad offer another market worth cultivating. With these are included the innumerable booklets and folders published by railroad and steamship lines. In this field whatever is beautiful, or curious, or interesting in the big cities, pleasure resorts and picturesque corners of the world will sell at one time or another. It may be an old doorway in Munich, a sunlit cañon in New York, a group of friars on Via Dolorosa in Jerusalem, Edgar Allen Poe's tomb in Baltimore, or a detail of the White City at Coney Island, which will net $2 for a column-wide cut or $25 for a front cover. You never can tell. The only thing is to keep your eye open for news and picture material, and find the market for it when you have the prints ready.

Sport Pictures

The papers devoted to sports offer a profitable field for those who have the sporting instinct and the special equipment required by the sometimes exacting conditions in which the work has to be done. Apart from the newspapers with sport pages, many sports, such as yachting, motor-boating, tennis, aquatics, motor-cycling, aëronautics, golf, baseball, etc., have their own journals, needing new illustrations for every issue.

Children's and Women's Papers

The children's magazines, whether dealing with their amusements or education, or with such specialties as the arts-and-crafts movement, offer a particularly good market for the press photographer, but do not seem to have received so much attention as they deserve. I remember a series of articles on model building published in "St. Nicholas," which the writer told me were accepted largely because he illustrated the building of the models, step by step, with photographs. The arts-and-crafts educational magazines afford many opportunities for the photographic illustrator, and the papers published for home-makers should not be overlooked. The photograph is undeniably the best method of teaching how to do things where manual dexterity is in question, e. g., the trimming of the hair or a hat, arranging cut-flowers, etc.

General Interests

The field of general periodical literature is all the time widening its pictorial range, and offers increasing opportunity. The news weeklies want pictures of men and things of current interest; the monthlies need all kinds of subjects; the book magazines seek illustrations of scenes and subjects with literary interest; the art journals are always ready to consider photographs which will help or interest the student or teacher of the arts. The special-class journals, such as those devoted to social service, child welfare, good roads, civic activities, and the like, depend for their interest largely upon their illustrations.

Trade Papers

The trade journals are a special field, and require careful study because their requirements usually fall within a narrow compass. But they have their opportunities for those who can supply what the editors need.

Books

Beyond the illustrated press we have the great market offered in the illustration of books, whether for special illustrated editions or for holiday books and booklets, such as appear in great variety at the Christmas season. Only a few days ago I saw a few items in the line of a prominent publisher, prepared for the forthcoming season, in which photography figured to the exclusion of every other basis of illustration. All this means a wider market for the photographic illustrator.

Advertising Literature

Then there is the ever-growing demand for illustrative material in the world of advertising and publicity, for which the photograph is peculiarly adapted. This market is so plainly in evidence in the magazines and general publicity schemes that I need not do more than mention it here. The whole art of making money with the camera lies in keeping one's eyes open to the opportunities about us in these fields, and getting after the needs of the market with intelligence and method. The increasing use of pictorial photographs in the field of art reproduction, post-cards, "art studies," nature-picture series, and the like, is similarly so well known that the mere mention of the field is sufficient to bring its profitable opportunities before the reader's eye.

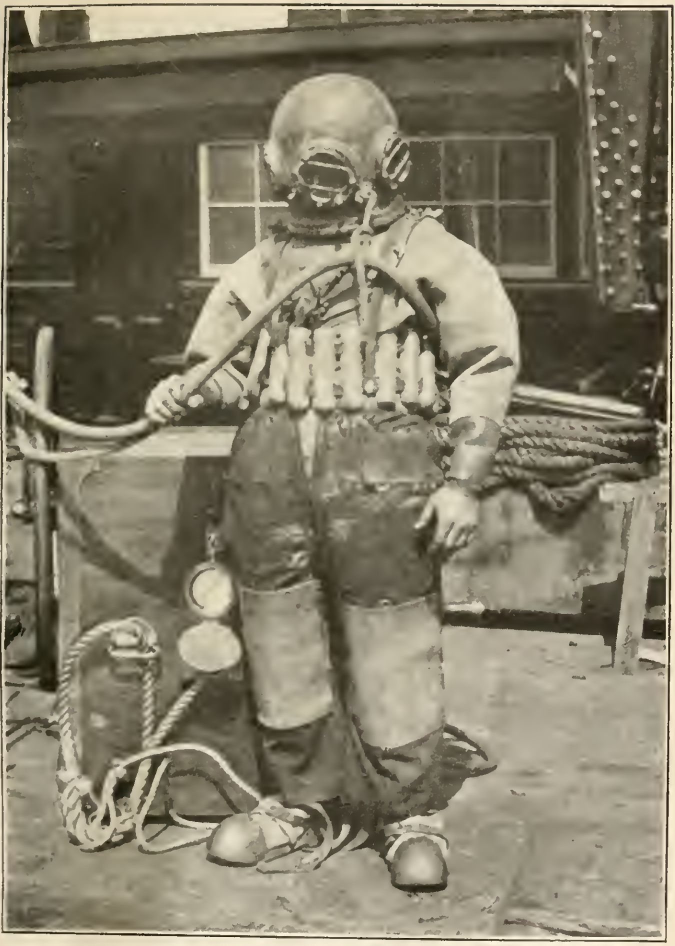
Making the Most of a Subject

It should not be forgotten that a print, or series of prints, may be available for use in many different papers. Thus, a few weeks ago the art supplement of a Sunday newspaper reproduced a half-dozen views of a medieval palace in the heart of New York. A wealthy citizen built for his town house a clever reproduction of an Italian Renaissance palazzo, and filled it with treasures gathered from a hundred old European cities. What an opportunity for the press photographer who could secure permission to photograph the house and its contents! There is the gloomy, castle-like façade, battlemented, with leaded casements and grilled doorway; the entrance hall with low, groined ceiling and curved, stone stairway; an ancient altar with its candlesticks and triptych; high-backed chairs and low, long, stone benches; recesses with statuary; priceless tapestries and heavily carved furnishings; a great library enriched with wonderful windows; a dining-room with paneled walls and massive sideboard, chairs, etc.; a music-room appropriately fitted; and the thousand-and-one details of historical or artistic interest naturally found in such a home.

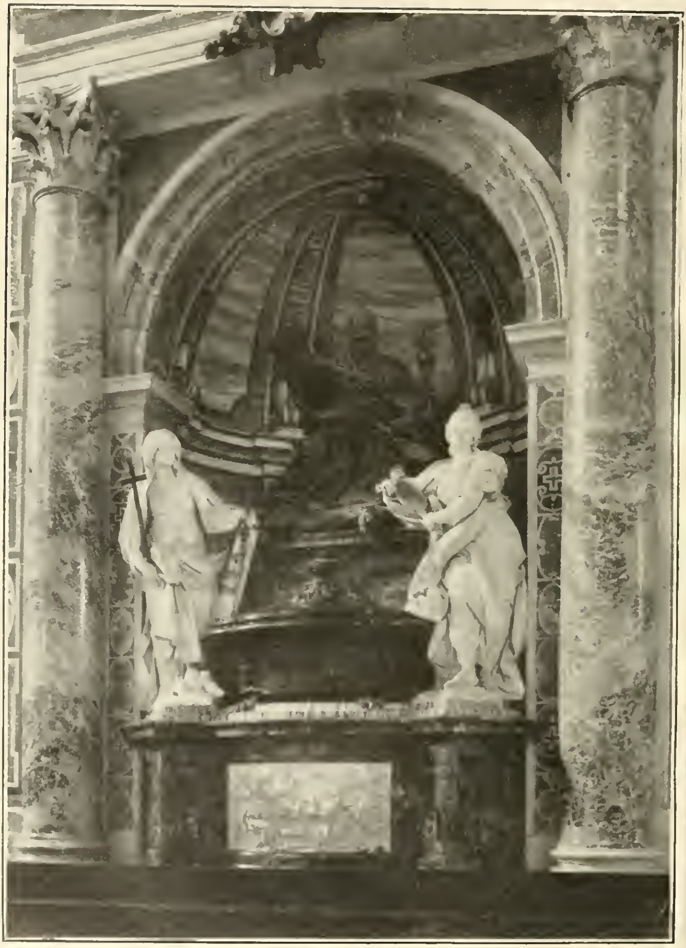
Such illustration opportunities may be found everywhere, here and abroad, differing widely in interest, but all alike offering splendid material for the press photographer, who finds in them subjects which he can sell to newspapers, illustrated weeklies, and the papers devoted to home-building and decoration, furniture and society papers, art journals, and the like. It is no exaggeration to say that a subject such as the above should be worth at least a hundred dollars to the man or woman knowing how to handle the material it offers and where to place their work.

An Idea Worth $4,000

An example such as this shows, too, how the photographic illustrator needs to broaden his photographic skill. No question but that this medieval palace would test the skill of many a photographer, and call forth all his technical resourcefulness. But the game is well worth while, and is not, after all, so difficult as it looks. And there may be profitable developments from work of this class. I recall the instance of an amateur who worked quietly and persistently until he had photographed the interiors and exteriors of the two hundred Catholic churches of New York. He took pains and trouble to get technically perfect negatives with his small camera, from which he later made enlarged negatives and a collection of platinum prints. The marketing of these took the leisure time of two years, but in the end the



Diver, fully costumed for his work
(Photograph: Courtesy of S. H. Horgan)



Cenotaph of Pope Alexander VIII, St. Peter's, Rome collection brought him a net profit of $4,000 (£800), which well repaid him for his labor of love.

Prints for Illustration

A word about the technical quality of the photograph required in illustration work. Apart from the extraordinary happening or unique subject, as when the chance comes to get a view of an airship disaster, a railroad collision, an ocean liner sinking at sea, or the assassination of a king, in which event there will be no question of technical quality, the press photographer should aim, first and last, for the good, straight photograph, clear, sharply defined and full of crisp detail. This is the basis of all illustration work with the camera, and such photographs are always given the preference wherever the buyer has any choice. Which is not to say that the softly defined, pictorial photograph is useless and will not sell. Far from it. Dozens of pictorialists are at work all the year round for magazines and books of the better sort, and get big prices for their work when once they have found their particular market. But the majority of illustrators working with the camera will naturally aim to supply the bigger field of everyday demand, and in this field it is the clear, straightforward photograph that wins, one which tells its story at a glance and gives a pleasing reproduction under ordinary conditions.

The Vital Point

The one important thing about the photograph intended for illustration is the absolute need of vital interest, either in the subject itself or in the manner in which it is represented. This applies to every sort of illustrative work, yet, strangely enough, it is the one point most generally overlooked by the beginner in this field. Be sure that your picture has something interesting to say, and that it tells its story in an interesting way, without need of explanation. Make the point of the story plain.

Reaching the Editor

How shall the press photographer reach the editors who want his work? This is an important question, but easily answered. Study the field carefully before beginning to send out your prints. One would think this advice needless, but it is a fact that the editors of engineering papers are now and again called upon to decline photographs of outdoor sports, and editors of news weeklies have to return pictures of "The Old Swimmin' Hole" type, sent in by thoughtless would-be illustrators operating on the hit-or-miss plan. Study the papers and study the editors. Spend a few hours at the nearest library, or send a dollar or two to a news agency with an order for a bundle of sample copies of illustrated weeklies or monthlies, and go carefully through them with a notebook. Give each paper a page in your notebook, and on it make a memo. of the sort of subjects and pictures that particular paper uses. Familiarize yourself with the preferences and requirements of, say, twenty like papers, and then go over your collection of negatives or prints, or the possibilities in subjects within your reach, and thus go after your market in an intelligent way.

Studying Special Needs

Suppose, for example, that you decide to cultivate the field of children's papers. Look through two or three subscription agency lists, and make for yourself a list including every paper in your chosen field. Then get sample copies of each paper, or consult the files of such as may be accessible at your local library. Now, with a knowledge of what you can offer in the way of pictorial material likely to be useful to the editors of the papers, make up a little letter of introduction and get in touch with the editors (always inclosing a stamp for a reply). The response to this effort will bring you information which will enable you to size up the possibilities of the field, and to take advantage of its needs at any future time, when you may have subjects likely to find acceptance. It is impossible to over-emphasize the importance of this careful study of papers and their editors, the careful sifting of your material and the illustrative possibilities within your reach. Half the failures and disappointments in press photography are the direct result of the lack of this preparatory work. It means a waste of time and postage and money, apart from the inevitable discouragement it brings.

News Pictures

For the newspaper, the picture must have news value, apart from its merits as a record of the thing or scene photographed. Thus, in the case of a big fire involving prominent local buildings, there should be a photograph of the building taken before the fire and another after the fire; but a picture made during the fire, showing the fire department at work on the building is essential to give the collection news value. Take, for another example, the selection of a summer home for President Wilson. Here, not only the Summer White House itself is a subject with news value, but a series of pictures of the surrounding locality, with photographs of Windsor, Vt., Cornish, N. H., Ascutney and the many lovely scenes along the Connecticut River, are all salable to the newspaper and illustrated weeklies. Let us suppose that a big modern girls' school is built in your locality. Photograph it all the way through: laboratories, study-rooms, dormitories, kitchen, chapel, gymnasium, theater or great hall, grounds, gardens and approaches. Out of your series there will be several acceptable for newspaper use; others will be useful for educational or school papers; the building contractors will buy others, and it should not be difficult to persuade the school authorities to take sufficient prints to make up a school booklet for advertising purposes. These examples will serve to point out the opportunities which are continually opening out around the reader. There is no lack of material, once the news sense is awakened.

Descriptive Data

In submitting prints to editors, it is essential to attach to each print a descriptive title, with such interesting data concerning the subject as you can supply. There is no need to attempt any fine writing in this, all the editor wants is a few facts which will enable him to label the picture, or give emphasis to its peculiar interest. Thus, with pictures of an accident or public event: Give the day and hour of the happening; the name of the town, street, etc., where the event happened; the names of the principal people involved or included in the picture; and every other fact which may seem of interest connected with the scene.

Prominent People

One of the most profitable markets for the press photographer is the supplying of pictures of men and women prominent in public life. These may be obtained at all times and in all places, but the large cities naturally offer the widest opportunity. There is sufficient material of this kind in Washington, New York and London to keep half a dozen workers busy all the time. But there are few places where one may not add subjects of this class to one's collection. A convention of librarians at Ann Arbor; society life at Bar Harbor, Palm Beach, Newport; a naval review at New York or Southampton; a yacht race at New London, Newport or Cowes; the commencement exercises at any college or university; or a suffrage parade in Chicago, London or New York, brings together all sorts of people around whom the news interest centers. The making of such pictures should not be confined to those showing the subjects in public. Get little groups and single portraits.

Avoid the Commonplace

Wherever possible, the worker should try to get permission to make pictures of such subjects in private life, at home, engaged with their families or household interests. Thus, a series of prints showing a noted suffrage leader busied with the life of her country house, in the gardens or about the stable or garage, entertaining a party of friends at a lawn tea, and the like, is quite as salable as, or more so than, a snapshot of the same subject taking part in the suffrage demonstration. The same applies to public men, whatever their field of work. Get pictures of them in their offices, or in the hunting field, at a hotel, or resting comfortably at a friend's house, or engaged in some hobby or sport. Never lose the chance to secure a photograph of anyone who has what may be called a public interest, or who, for one reason or another, may be of interest to the public in the near future. It is impossible to foresee when the need for photographs of them may arise; but, when that time comes, the photographer who can supply prints with the least delay will reap the reward of his or her enterprise.

Other Subjects

News pictures are not always pictures of people. All sorts of places, houses, localities, views and objects are, or may become, of public interest. The public buildings and notable houses of even a small city may at any time be in demand as news subjects. There is a huge industrial strike in a small manufacturing town, and instantly the newspapers want pictures of the factories, the streets where the workers live, the workers themselves on their way to and from the factories, the better-class residential portions of the town, and other points around which the action of the strike may center. Even if there be no local disturbance of the sort mentioned, a series of pictures portraying the life of such a town is likely to have marketable value in this or that direction if the field be properly studied.

The Personal Factor

The question of apparatus may bother the beginner, until he or she realizes that it is not the camera or equipment that matters, but the personal capacity and resourcefulness of the man or woman behind the equipment. Most emphatically, making money with the camera does not depend chiefly on the equipment. Some of the most successful press photographers I know began with an outfit costing less than twenty dollars. Make a rule in the beginning that your illustration work must pay for all the increases required in your equipment as you go along. If you begin with a camera which seems to have more limitations than efficiencies, limit your work to the capacity of the equipment and make it produce what income you need for the purchase of better apparatus.

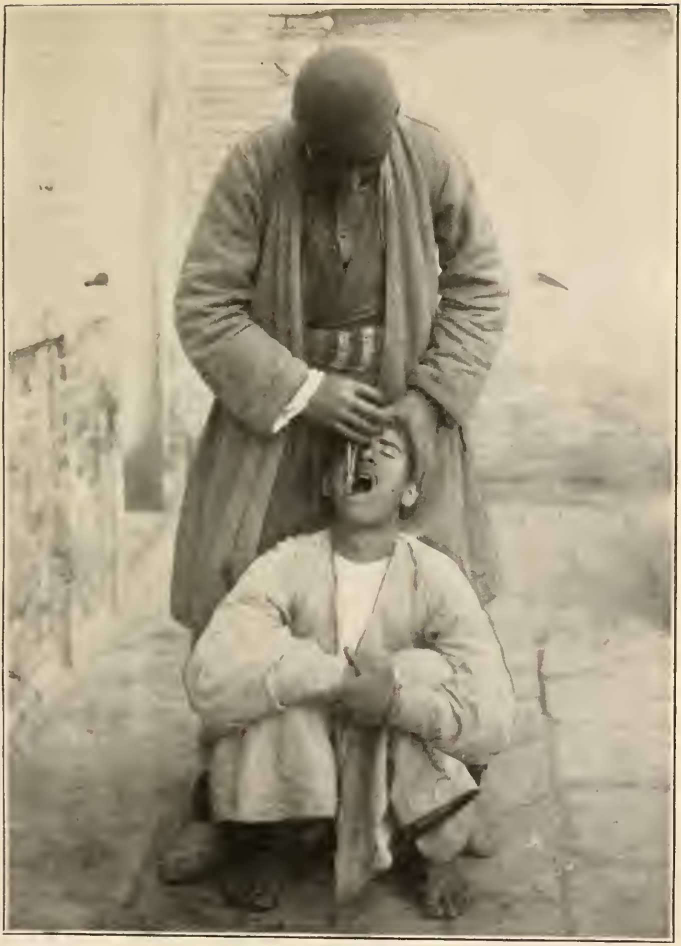
How It Tells

I have in mind an amateur, confined by long illness to one room and possessing only the most modest type of film camera. It chanced that the home possessed a wonderful collection of small china and metal toy animals: Lizards, bulls, dogs, and the like, and the daughter of the house had a dozen or so little wooden manikins. By a hundred different groupings of these subjects on his table, mimicking scenes in everyday life, this amateur produced a series of droll pictures which found ready acceptance with a German post-card firm, and brought him a sum which enabled him to purchase the finest photographic outfit he could desire. Let the reader try a few groupings of a teddy-bear and a telephone on a table, and he will quickly appreciate the possibilities of this humble but profitable field of illustrative work. A glance over such magazines as "John Martin's Book," or a few children's books, will show him the market-place for work of this class, quite apart from the post-card field. One of the most successful sellers of a few years ago, among the picture shops, was a series of five pictures of a "Punch and Judy" show, made by an amateur at home with the help of his children. People will readily buy, and picture-publishing houses are more than willing to pay for, any subject which speaks to the heart or memory of days past. The endless demand for pictures of "The Old Swimmin' Hole," "A Good Catch," and similar types, provides an always open market for the photographer who has not the apparatus demanded for the more ambitious sorts of illustration work. It is probably true that the man or woman with a small camera of limited capacity and plenty of leisure will make more money than many a worker equipped with the last word in cameras, provided only that the former will concentrate on the possibilities of his or her special field and make the most of them.

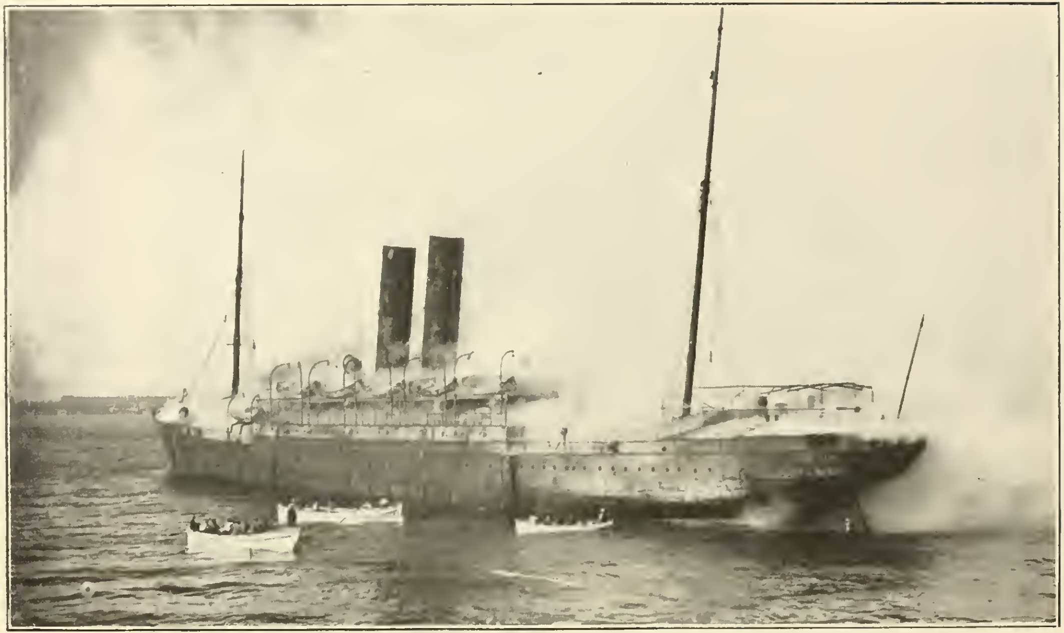
Chances in a Big City

Take the case of an amateur living in New York, with a pocket-camera, a little leisure and an ambition to make money with the combination. What a wealth of unused pictorial material is here available in the everyday life of the big city, teeming with that valuable asset, the human interest. The modern craze for Italian marbles has brought to New York, during the past few years, hundreds of marble lions, intended for the doorways of great houses. Along the streets, in front of the stores of dealers in antiques, at the entrances to the libraries, clubs, courthouses, and mansions of the wealthy, one may easily find dozens of these lions, in as many different attitudes, and with as many different expressions. The expression of a marble lion, by the way, varies with every change of viewpoint and lighting at different times of the day, and even at different seasons of the year. Thus a lion will have quite a different interest seen outlined by a shaft of sunlight, or in shadow, after a fall of snow, or as nightfall comes on. And they attract all sorts of curious groupings as the crowd passes: Now a little girl gazing with childish awe at the king of

179



A Persian Dentist at Work
(Photograph: Courtesy of S. H. Horgan)



The S. S. Saale on fire in the Hudson River: Hoboken Pier Disaster. Half a hundred men are imprisoned between decks. They are talking to the men in boats, but cannot be rescued owing to smallness of portholes

(Photograph by S. H. Horgan)

beasts; here a couple of street boys seated astride a lion, back to back; and now and again a policeman will take an unconscious pose which provides a side-splitting group. But the lions of New York do not seem to have caught the eye of the press photographer, despite the fact that half a dozen editors would buy if the interesting side of the collection was properly presented to them in a series of prints.

In like manner, an afternoon on a sunny day in the parks, along Riverside Drive among the children of the wealthy, or down in Corlears Hook Park on the East Side; or around a public school in the Harlem Ghetto; or about the dock entrances when an ocean liner comes in; or an hour or two at the great railroad terminals; or at the piers when the big seashore excursion boats load and unload their human freight; or the curious scenes one may see at any busy subway station entrance between 8 and 9 a. m. or 5 and 6 p. m., will all furnish salable material to the photographer who knows an opportunity when he sees one. Everything that has the life or news interest, a trick of the humorous or pathetic, of the swirl of youth and femininity in it, is a good subiect to sell to some paper or other, and the pocket-camera is here quite as useful, as a money-maker, as the most expensive of outfits.

The Standard-Size Print

Since, however, the standard size of print for most papers is 5 x 7, and prints smaller than post-card size are rarely acceptable for reproduction, the worker with a pocket-camera will assuredly need an enlarger to bring his pictures to the required size. The providing and manipulation of such an enlarger is now a very simple and inexpensive matter, as may be seen by a careful reading of THE PHOTO-MINIATURE No. 123, Enlarging on Gaslight Papers. In that little handbook, which everyone who has a pocket-camera should possess, may be found several designs and working details for the home-construction of simple enlargers and their use. If the reader does not care to make his own simple apparatus, according to the instructions therein given, he will find a wide variety of commercial enlargers at his dealer's, at prices ranging from $3.50 to $50. The new Viopticon, first introduced by the Victor Animatograph Company, Davenport, Iowa, deserves special mention among these commercial lanterns, by reason of its peculiar efficiency and simplicity of operation. The point I want to make clear is that the making of 5 x 7 enlargements on development papers, from small negatives, is today as simple a matter as making a print, involving no more trouble, time or expense.

Pocket-Cameras

Once a simple enlarging equipment is provided, the pocket-camera offers big advantages to the press photographer. It occupies so little space and is so very compact that it can be carried as a constant companion, thus enabling the user to get many subjects which would otherwise be missed. This is the secret of success in illustration work: The ability, capacity, and readiness to get, on the spot and at the moment, any subject that may appear to be salable in this or that market. For this always-ready equipment nothing can approach the pocket-camera, and almost all press photographers carry such a camera, regardless of any other instrument they may provide for special lines of work. The efficiency or capacity of the small camera varies, of course, according to its lens and shutter equipment, and this depends upon the price of the camera. Good work can be done with a Vest Pocket Kodak, an Ensignette, or a No. O Ingento, or an Ansco V. P., all costing less than $10. The more expensive cameras of this class, such as the No. O Graphic, Kodak V. P. Special, Ensignette Special, and Miniature Ica Cameras, have a much wider range of efficiency, covering all sorts of work, and, because of the high-grade lenses and shutters with which they are fitted, give pictures better suited to yield crisp, sharply defined enlargements than are possible with the cheaper sorts of pocket cameras. This greater efficiency, where the worker can secure it, is well worth the larger initial cost, since it enables the worker to get his subjects when and where they come.

Reflex Cameras

Apart from the question of size, there can be no doubt about the superiority of the reflex type of camera for press photography. To be able to see what you are getting on the plate, to see the picture image full size, right side up, right up to the instant of exposure, together with the advantages of the optical equipment fitted to this type of camera, are advantages well worth all they cost to the amateur seeking to get cash results in illustration work. Reflex cameras are bulky and heavy, and their first cost somewhat prohibitive, but experience shows that they are the best investment when proved out by the test of results. Beware of the cheap reflex camera. Where the initial investment required by a reliable reflex is beyond your purse, or seems so at the moment, get a good hand-camera of the folding type and make it earn a reflex for you. The following instruments are among the best of the reflex class: Graphic No. O; 1A Graflex; Mentor; Heliar Folding Reflex; Goerz Folding Reflex; Houghton Folding Reflex and Ensign Box Reflex.

The Post-card Size

A favorite outfit with many press photographers is the post-card or 3½x5½ hand-camera, fitted, if possible, with all anastigmat lens and shutter working to 1/250 of a second. This is obtainable in a variety of models and offers a wide capacity of all-round usefulness, whether for indoor or outdoor work. The 3½ x 5½ print is convenient in size for many uses without the necessity of enlargement, and the proportions of the picture size make the form advantagous for most classes of subjects.

Use a Tripod

For all save pocket-cameras a good rigid tripod is indispensable on occasion. Much of the poor quality of amateur photography is due to the universal neglect of the tripod. Let your motto be: Use the tripod whenever you possibly can, and you will see an improvement in your work, and have less failures.

Lenses

Unquestionably the most important item in the technical equipment of the press photographer is his lens, or battery of lenses, since no one lens will produce the best results in different classes of work. Clear, crisp, sharply defined and fully detailed photographs always win the favorable attention of the editor in search of illustration material, and apart from the technical skill of the photographer in exposure and development, these qualities in the print depend most largely upon the quality of the lens used in making the negative. The reader who possesses only the little $f/11$ meniscus or $f/8$ rapid rectilinear lens attached to his one and only hand-camera, need not worry unduly over this question of lenses. With what he has he can easily get and sell prints which will enable him to purchase the better lens he desires or needs. But, as soon as possible, get an anastigmat and learn how to use it. Where critical definition and speed are needed, and they are often essential in press photography, the anastigmat offers enormous advantages. A lens of this class, working at $f/6.3$ or $f/6.8$ or even faster, and having a focal length at least equal to the diagonal of the plate used, may be regarded as the standard optical equipment. A similar lens, with a focal length twice the base measure of the plate, will give larger picture images, a much narrower field of view, and better drawing or perspective effects, where the camera extension will permit of its use. Where the extension of the camera does not permit of the use of such a lens, the same advantages may be obtained with a Cooke-Telar lens on a short bellows extension camera, such as the ordinary hand-camera. When much interior or street photography is to be done, a wide-view angle within a limited distance being desired, a "wide-angle" or short-focus lens is advised, but should be used only when this is absolutely necessary.

Know Your Lens

Whatever lens is available, much of the worker's success will depend on his practical knowledge of its capacities and use. Study your lens until you know just what it will do under all sorts of conditions, try it out in every way you can think of and with different classes of subjects, so that when you have to depend on its performance in the field, it will get you the results you seek.

Focus: a Vital Point

Much of your success in negative making out-of-doors will depend on your real knowledge of the depth of field available with the lens in use when different apertures are used. A little digression on this important detail of focusing may be helpful. It is generally advised that the best way to secure the maximum depth of definition, in photographing any given subject, is to focus on some point in the middle distance of the subject and then stop the lens down (i. e. use a smaller aperture) to get the near distances in focus. But this involves a loss of speed which may be fatal to success with some subjects. A better method is to set the lens at the infinity point on the focusing scale attached to the camera, and let the near distance come as it will. This suggestion is based on the presumption that the infinity mark on most hand-cameras is really the hyperfocal distance of the lens, which, in practical effect, gives the far distance very slightly diffused in focus (i. e. not critically sharp) and extends the depth of field to a point nearer the camera than the use of a true infinity point.

Hyperfocal Distances

Without going into an elaborate disquisition on focusing, it will repay us to give a little attention to this detail of hyperfocal distance. Practically, the term means the distance from the camera beyond which all objects will be in fairly sharp focus, and which gives the maximum depth of definition. This distance varies according to the focal length of the lens and the aperture in use—presuming for the moment that 1-1000 of an inch is accepted as the standard disc of confusion. It can be found, for any lens and aperture, by the following simple formula: Multiply the focal length of the lens by itself, then by 100, and divide the result by the aperture (*f*) number, and by 12 to bring it to feet. For example: We require the hyperfocal distance of a 4-inch lens at *f*/4:

$$\frac{4 \times 4 \times 100}{4 \times 12} = 33 \text{ feet, 4 inches.}$$

The more the reader knows about the use of lenses, the influence of focal length and variation of apertures upon the available depth of field or definition, the more easily will he obtain general sharpness of definition in his pictures.

A Handy Table

The following table gives at a glance the hyperfocal distances for lenses of various focal lengths and apertures.

Focal length of lens in inches	Diaphragm apertures or *f* numbers							
	f/4	*f*/5.6	*f*/7	*f*/8	*f*/11	*f*/16	*f*/22	*f*/32
	Hyperfocal distances in feet							
3	19	14	11	10	7	5	4	3
4	33	24	19	17	12	8	6	4
4¼	38	27	21	19	14	10	7	5
4½	42	30	24	21	15	11	7½	5½
4¾	47	34	27	24	17	12	8½	6
5	52	36	30	26	19	13	9½	6½

Its Uses

This knowledge of hyperfocal distances has several uses. If we focus on an object at the hyperfocal distance, we may be sure, not only that everything beyond that distance will be sharp, but also that all objects situated beyond one-half the hyperfocal distance will be sharp. For example: If with a 4-inch lens at *f*/8 we focus sharply on an object 17 feet away, then all objects 8 feet, 6 inches or more distant from the camera will be sharp. This varies with focal length and aperture.

Finding Depth of Field

Similarly, if we know the hyperfocal distance of a lens at any given aperture and focus upon an object at any given distance, we can readily ascertain what are the nearest and farthest distances between which everything will be sharply focused; in other words, the limits of depth of definition. To get the nearest distance at which objects will be sharp, we multiply the hyperfocal distance in feet by the distance of the object focused in feet, and divide the result by the hyperfocal distance in feet *plus* the distance of the object sharply focused in feet. To get the farthest point, multiply as before, but divide the result by the hyperfocal distance *minus* the distance of the object focused in feet.

For example: we have a 4-inch lens working at *f*/8 and we focus sharply on an object 12 feet away. The hyperfocal distance for a 4-inch lens at *f*/8 is 17 feet (see table). Therefore, the distance of the nearest object in focus is:

$$\frac{17 \times 12}{17 + 12} = 7 \text{ feet.}$$

In like manner the farthest distance is:

$$\frac{17 \times 12}{17 - 12} = 40 \text{ feet, 8 inches.}$$

So that the depth of definition (or field) is 33 feet.

Lens Exposure

Granting that the reader is familiar with the capacities and limitations of his equipment, with a special knowledge of his lens and how to handle it, his ability to secure technically good negatives will depend most largely on a practical knowledge of exposure under widely varying conditions as to time of day and season and with different classes of subjects. To deal with exposure properly would require the writing of a book, but a few hints and handy tables may be useful, even to those who depend upon exposure meters and other mechanical helps.

The factors which govern all exposures are few and simple, viz: The aperture of the lens; the sensitiveness of the plate; the strength or intensity of the light; and the character of the subject photographed.

These, naturally, still form the staple features in discussing exposure, but there must also be borne in mind the ability of different types of shutters to give the exposure which has been found necessary; the ability of the plate to "make good" with less time when the rapidity of movement in the subject compels a very short exposure; as well as the limits, as regards hand-camera photography, which are set by the use of a screened ortho plate. Something must be said, too, as to exposure conditions in photographing from moving vehicles, railway trains, steamboats, and electric cars.

Apertures

Of the four factors mentioned above, the variation of exposure required by variation of lens aperture is, perhaps, the chief difficulty with amateurs in outdoor photography. This may be briefly explained as follows:

As the reader no doubt knows, a lens aperture is denoted by the *f* number, that is, the number of times which the diameter of the aperture divides into the focal length of the lens, Thus, a lens of sixteen-inches focal length and two-inch diaphragm is said to have rapidity of *f*/8, or "to work" at *f*/8. The first general rule in exposure is that *the time required varies as the square of the f number.*

Thus, with an *f* number twice another, one must give *four* times the exposure; with one three times another, one must give nine times the exposure. That rule applies in all cases, but it is important to distinguish between the *f* numbers and U. S. diaphragm numbers, because the latter are specially designed to avoid the use of "squared" numbers.

U. S. Numbers

The basis of the U. S. stop is an aperture one-fourth the diameter of the focal length, that is *f*/4. This is No. 1 on the "Uniform System." No. 2 is a stop of double the *area*, corresponding therefore with double the exposure, and equaling *f*/5.6. Similarly, No. 4 U. S. is again double the area of No. 2, or double the diameter of No. 1. It is therefore *f*/8. The advantage of the "Uniform System" is that the numbers represent the relative exposures. The method was abandoned in England a few years ago, and is now used only on Kodak and other cameras made in the United States.

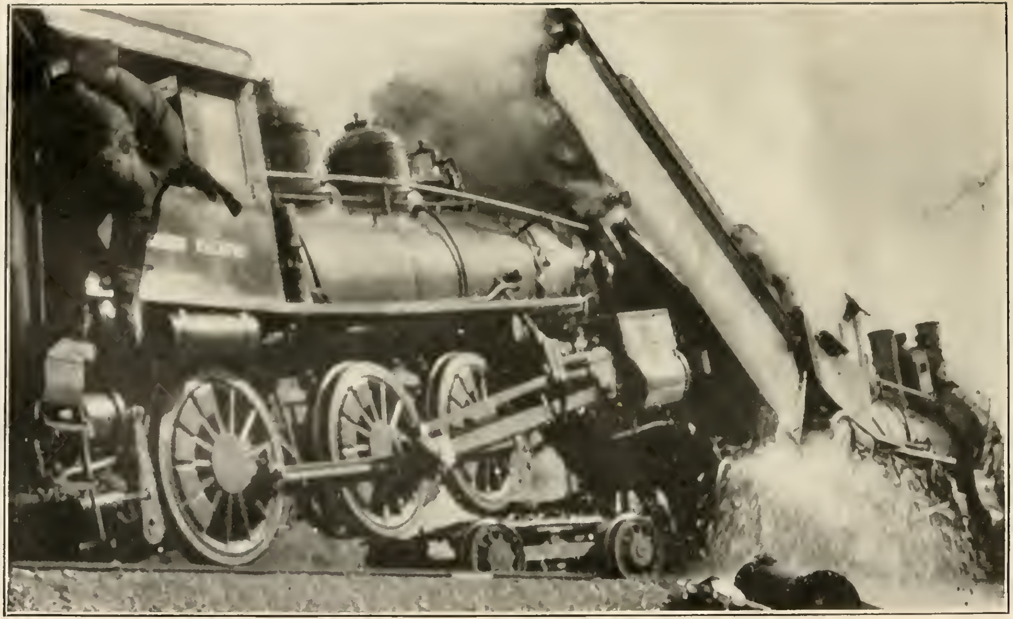
The following table gives the *f* numbers equivalent to standard U. S. apertures:

U. S.	1	1¼	2	3	4	8	16	32	64	128	256
F. No.	*f*/4	*f*/4.5	*f*/5.6	*f*/7	*f*/8	*f*/11	*f*/16	*f*/22	*f*/32	*f*/45	*f*/64

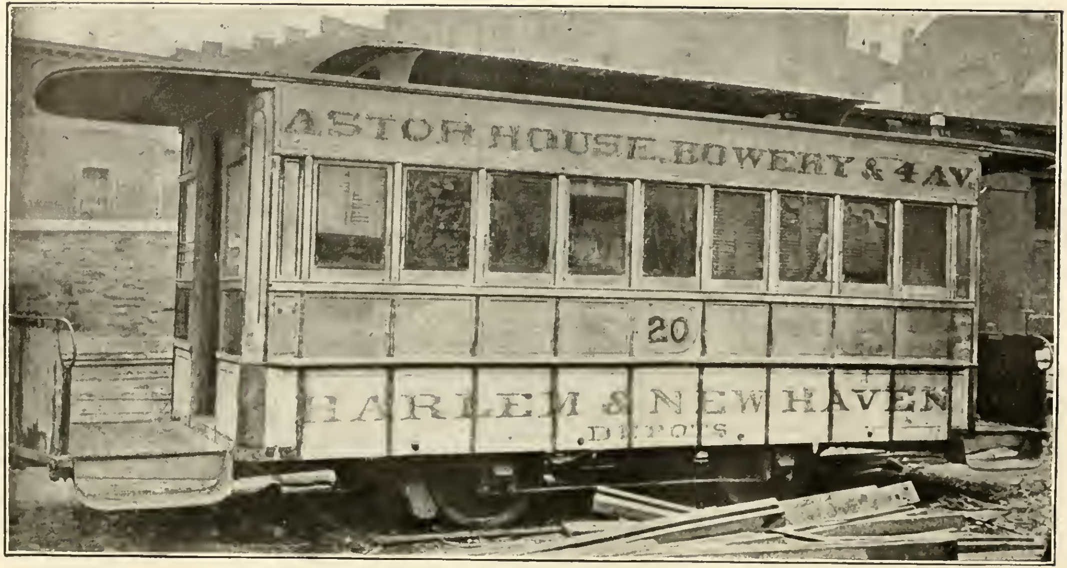
With the exception of *f*/4.5, which is inserted here on account of the frequency with which it is now used, each stop in this series calls for twice the exposure with that preceding it.

Diaphragms and Exposures

We have seen that the *f* number is the result of dividing the focal length by the diameter of the aperture. Consequently, if (when using the same lens) either of these quantities is altered, the necessary allowance must be made in the exposure. The reader sees at once that the diameter of his stop varies by opening and closing the lens, but he may wonder how the focal length of a lens can vary. Let us take the latter in a moment. First



Snapshot of an actual railroad collision; men escaping from cab
(Photograph: Courtesy of S. H. Horgan)



One of the first Fourth Avenue, N. Y., horse-cars, 1837
(Photograph: Courtesy of S. H. Horgan)

as regards the stop. It is a geometrical fact that the area of a circle, or disc, varies not in proportion to its diameter, but in proportion to the *square* of its diameter. That is, our diaphragms admit light in proportion to the square of their diameters; but as, in obtaining the *f* numbers, we divide the focal length by the diameter only, and not by the *square* thereof, we must take the squares of the *f* numbers as the basis of comparative exposures. As lenses are fitted with diaphragms from *f*/4 to *f*/64, this factor alone amounts to a variation of exposure of from 4 x 4 or 64 x 64 = from 1 to 256. In other words, if a subject requires one second exposure at *f*/8, other things remaining the same, it will want one-fourth second at *f*/4 and sixty-four seconds at *f*/64.

Slow and Rapid Lenses A good deal of mystification is created by the statements of lens-makers that certain lenses are "extremely rapid." Beginners, I know wonder whether one lens at, say, *f*/6, is more speedy than another of the same aperture. Actually (in practice) there is no difference. Practically any lens, unless its glasses have become colored with age or have suffered great loss of polish, is as rapid as any other of the same *f* number. Any difference which may exist is due to the greater or less number of glasses (and therefore of reflecting surfaces) in the lens, or to the greater thickness of glass. But when all is said and done, these variations in construction will not account for a difference of more than 20 per cent in the rapidity of the lens at the outside; in other words, six seconds' exposure instead of five. The reader will be safe in taking aperture, and aperture only, as the measure of the rapidity of a lens. We should call a lens of *f*/4.5 one of "extreme rapidity," as large an aperture as it is useful to have; one of *f*/5.6 or *f*/6, a "rapid" lens (the most useful aperture for all-round work), and lenses of *f*/8 and under as "slow," and suitable chiefly for time-exposure work, not for hand-camera or instantaneous photography except under favorable conditions.

Lighting: Its Effects As a rule, the lighting most favorable to a good photograph is direct sunlight coming from behind the camera from a point about midway between back and side,—that is to

A USEFUL TABLE GIVING THE EXPOSURES REQUIRED IN BRIGHTEST SUMMER SUNLIGHT (CLOUDS IN SKY REFLECTING LIGHT INTO THE SUBJECT) WITH ULTRA-RAPID PLATES OF SPEED, 250 WATKINS (111 WYNNE)

	Clouds	Sea	Open (distant) Landscape	Light foreground, landscape, etc.	Strong foreground, landscape, etc.	Extra heavy foreground	Under trees	Interiors, light in color and well lighted		Interiors dark
								Min.	Sec.	Minutes
f/4	1–2000	1–1200	1–600	1–300	1–150	1–75	⅛		½	½
f/5.6	1–1200	1–600	1–300	1–150	1–75	1 35	¼		1	1
f/8	1 600	1–300	1–150	1–75	1–35	1–18	½		2	2
f/11	1–300	1–150	1–75	1–35	1–18	1–8	1		4	4
f/16	1–150	1–75	1–35	1–18	1–8	¼	2		8	8
f/22	1–75	1–35	1–18	1–8	¼	½	4		16	15
f/32	1–35	1–18	1–8	¼	½	1	8	½	—	30
f/45	1–18	1–8	¼	½	1	2	16	1	—	60
f/64	1–8	¼	½	1	2	4	30	2	—	120

say, from the northeast or the northwest point of the compass, supposing the lens is pointing directly south. The same rule holds good, though in lesser degree, if the sky is more or less clouded ; but then the same brilliance of result cannot be expected. With an unclouded sky, the chief beauty of sunshine, that of the shadows, is lost if exposures are made around noon. The best time of the summer day is really before nine o'clock in the morning and after three o'clock in the afternoon. When the sun is higher in the heavens the cast shadows are both short and intense. Two kinds of lighting are especially to be avoided: namely, that in which the sun directly faces the camera, and that in which it is directly behind it. The former turns the shadow side of the subject to the camera and calls for a very greatly increased exposure. The second removes all relief and contrast from the subject, owing to the absence of cast shadows. It calls for much less exposure than the same subject under good lighting. These few simple rules will put the beginner in the way of avoiding failures.

Subjects with Movement

In dealing with subjects including moving objects our calculations must be made on a different system. Here we have not to expose long enough to get a correct rendering of the light and shade in the subject (as under normal conditions with subjects not including movement), but short enough to prevent the object forming a blurred image on the plate or film, consequent upon its movement during the period of the exposure. As a useful basis for calculating exposures of this class, we will take that of a lens five inches focal length, supposing the object to be twenty-five feet away, or approximately the width of a roadway in which not more than three vehicles can pass each other readily. This condition means that a man of six feet will appear on the plate one inch in height, and similarly other objects will be reproduced about one-seventieth their actual size. Keeping these fairly average conditions in mind, we must further learn that it is the *direction* in which an object is moving with regard to the camera which very greatly decides the speed of the shutter which is necessary or permissible. If the subject is advancing directly toward the camera,—that is, more or less along the axis of the lens,—the movement is far less apparent than if he is crossing the field of view at right angles. Roughly it may be said that, in the case of the "end on" movement, the exposure can be three times that which is necessary to secure sharpness when the subject is going across the field of view. If the movement is obliquely toward us,—or, what is the same thing, if the camera is directed obliquely to the path along which the object is moving,—the exposure may be about twice that necessary for the "cross" movement. To take a concrete case of a carriage moving, say, at eight miles per hour, the exposure will be about as follows: End on, one-eightieth second; oblique, one-one-hundred and fiftieth second; cross, one-two-hundred and fiftieth second.

This is a rough guide to the effect of direction. As a rule, the high speeds which are necessary to secure sharpness of objects moving across the field make it impossible to deal successfully with anything but a walking pace under these conditions,—that is, with the majority of shutters which do not go above one-two-hundredth of a second.

The further the object or the shorter the focal length of the lens, the smaller the image, and the longer we can expose without sacrificing sharpness. Thus, if the object is fifty feet instead of twenty-five feet away, we can give double; if one hundred feet away, four times the exposure.

Exposures from Trains, Cars and Boats

Exposures from moving vehicles follow just the same rules as those named in the preceding paragraph as regards direction: We must shorten exposures when we point the camera at right angles to the direction we are traveling in, but can give longer when the lens is directed forward or back at an angle, say, thirty degrees, which is quite possible from a train, whilst from a steamer or electric car we can photograph directly in front or behind. In the case of a train moving from forty to sixty miles per hour, it is not possible to count on securing subjects other than open views, such as bays, estuaries, or open country, and for these an exposure of from one-fortieth to onesixtieth second will be quite short enough. In the case of steamers; the vibration from the motion of the ship is generally greater; but, as the subjects will do with very short exposures, it is the easiest vehicle from which to photograph. The best position is by the paddle-boxes, where vibration is less than either forward or aft. The greatest difficulties surround the use of the camera from the top of an omnibus or electric car. The horse 'bus and, still more, the motor 'bus, usually vibrates to such an extent that the exposure requires to be much shorter than would be judged from its speed only. About one-two-hundredth of a second may be taken as a guide, and the photographer must stand when releasing the shutter, otherwise he gets all the benefit of the vibration.

Speed and convenience of manipulation are the only points about development of special interest to the worker in illustration photography. These advantages, whether for plates or films, are best secured by the use of a tank, which disposes of at least six exposures in a single operation, and gives clean, well-developed negatives wherever the exposures are normal in character. Leaving the tank method out of consideration here as largely a matter of carefully following the instructions and formulæ supplied by the manufacturer of the tank used, I make room here for a brief account of Wallace's time and temperature method of developing plates in batches in a tray, as likely to be of practical service where plates are used and have to be put through quickly.

The developer for this method is made up as follows: *Stock Alkali Solution:* Water, 24 ounces; sodium carbonate (dry), 1 ounce. *Stock Pyro Solution:* Water, 9 ounces; oxalic acid; 12 grains; pyro, 1 ounce; add water to make the bulk of the pyro solution up to 10 ounces. *To develop, take:* Alkali solution, 6 ounces; pyro, ½ ounce. This makes a strong solution suitable for use with temperatures below 20° Cent. (68° Fahr.). With temperatures above this, it works rather too rapidly for convenience and should be diluted with an equal bulk of water. In this event, it is necessary to develop not quite so long again for the same contrast.

Its Preparation

In making up the formula given, the solutions are best prepared with water which has been heated to boiling point and allowed to cool somewhat before use. This is not necessary when only sufficient solution is made up at one time to last two or three weeks, as the use of boiled water is advised only in order to enhance the keeping qualities of the solutions. As a rule, water that is fit to drink is also suitable for developing purposes. Although the formula specifies dry sodas, the crystal form may be used by making the solutions to hydrometer test. In this use prepare carbonate and sulphite of soda solutions separately to hydrometer test 40° and then mix. In making up the formula by weight, Seed's C. P. sodas or any equally pure brands are advised.

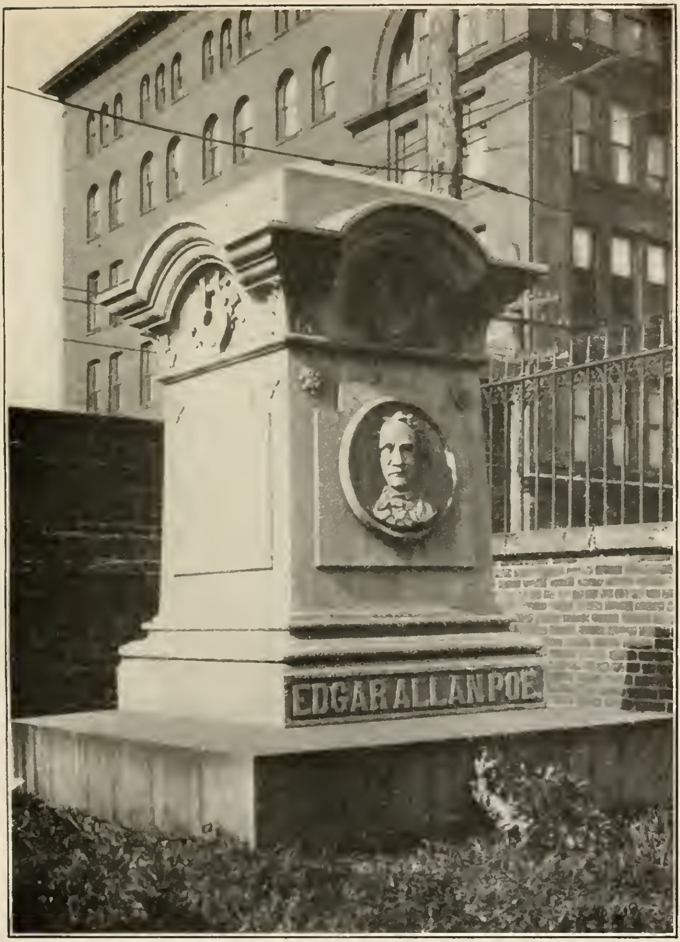
Fresh solution must be used for each plate or batch of plates, if more than one is developed at one time. A good way to determine the minimum quantity of developer required is to place in the tray an equal number of waste plates, and measure the quantity of water which is required to cover them when at rest.

Importance of Temperature

The trays and solutions used for developing should be kept together in the room where the work is to be done, so that they will all be at approximately the same temperature. Naturally, in this system, uniformity in results depends largely on this factor of uniform temperature. It is also necessary to observe reasonable accuracy in making up the developing solutions. If the thermometer in the darkroom hangs clear of its support, and there has been no recent severe change, the atmospheric temperature may be relied upon, otherwise the solutions should be tested just before beginning work. Always keep a glass or earthenware vessel filled with water and exposed to the air in the darkroom for the making up of stock solutions. Never take water from the tap for immediate use. Keep the solutions moving gently during development.

How to Use the Method

The method of using the tables is as follows: Having prepared the developer and taken care to have the various solutions at approximately the same temperature, the tem-



Poe's Grave in old Westminster Churchyard, Baltimore
(Photograph: Courtesy of S. H. Horgan)

Just Fishing, That's All
(Photograph: Courtesy of S. H. Horgan)

perature is first noted. Now find this degree of temperature in the first or second column at the left-hand side of the table (accordingly as the Fahrenheit or Centigrade thermometer is used) and at the intersection of the horizontal line with the vertical line leading to the contrast factor desired will be found in minutes and seconds the length of time to develop at this temperature. To illustrate: Suppose we are using a factor of 6 as giving us the desired range of contrasts, and that the temperature is 23° Cent. (73° Fahr.). At the intersection of the lines 23 and 6 will be found the figures 2 and 55, indicating the time of development as 2 minutes and 55 seconds. Similarly, if the temperature is 20° Cent. (68° Fahr.) and the factor 5 gives us the required range of contrasts, at the intersection of the two lines 20 and 5 will be found the figures 3 and 10, indicating that the time of development should be 3 minutes and 10 seconds. This is all we need to know. The plates are immersed in the developing solution, covered with a tray, and at the end of the indicated time are taken out of the developer, rinsed under the tap and placed in the fixing solution.

With regard to the choice of the contrast factor among those given at the head of the table, this must be determined by the personal preference of the individual as to the general character of the negative desired. Naturally this preference will be considerably influenced by the amount of contrast in the subject, this depending on the character of the subject and its illumination. In a normal subject such as a sunlit landscape, or street scenes, portraits out-of-doors, etc., where the range of contrasts is fairly large, softness will be gained by choosing a low contrast factor, and crispness with a decided relief can be secured by the choice of somewhat higher factor. In portraiture, where the range of contrasts is often small and softness is generally desirable, a low contrast factor is usually necessary. Contrariwise, in photographs of carvings in bas-relief, where the contrasts in the subject usually require emphasis, a somewhat higher contrast factor should be chosen. As a factor for general use, 5 will usually give a normal negative at 65° Fahr.

TIME AND TEMPERATURE TABLE FOR USE WITH THE WALLACE METHOD OF DEVELOPMENT, THE TIME BEING GIVEN IN MINUTES AND SECONDS.

Tempt.		CONTRAST FACTORS												
F.	C.	4	4½	5	5½	6	6½	7	8	9	10	11	12	13
59°	15°	3 min. 55 sec.	4 25	4 55	5 25	5 55	6 25	6 55	7 50	8 50	9 50	10 50	11 50	12 50
60°	16°	3 30	4 00	4 25	4 50	5 20	5 45	6 10	7 05	7 55	8 50	9 45	10 35	11 30
62°	17°	3 15	3 40	4 05	4 30	4 55	5 20	5 45	6 30	7 20	8 10	9 00	9 50	10 40
64°	18°	3 00	3 20	3 45	4 05	4 30	4 50	5 15	6 00	6 45	7 30	8 15	9 00	9 45
66°	19°	2 45	3 05	3 25	3 45	4 05	4 25	4 45	5 30	6 10	6 50	7 30	8 10	8 55
68°	20°	2 30	2 50	3 10	3 30	3 50	4 05	4 25	5 05	5 40	6 20	7 00	7 35	8 15
70°	21°	2 20	2 35	2 55	3 10	3 30	3 45	4 05	4 40	5 15	5 50	6 25	7 00	7 35
72°	22°	2 10	2 25	2 40	2 55	3 10	3 25	3 45	4 15	4 50	5 20	5 50	6 25	6 55
73°	23°	2 00	2 10	2 25	2 40	2 55	3 10	3 25	3 50	4 20	4 50	5 20	5 50	6 15
75°	24°	1 50	2 00	2 15	2 25	2 40	2 55	3 10	3 35	4 05	4 30	4 55	5 25	5 50
77°	25°	1 40	1 50	2 05	2 15	2 30	2 40	2 55	3 20	3 45	4 10	4 35	5 00	5 25

Prints

In all prints for reproduction, some loss of detail and of the finer values being inevitable, the choice of printing papers is necessarily restricted to those papers which will yield maximum detail, a long range of gradation and general brilliancy or crispness of definition. Such papers are found in all the many brands of development printing papers, such as Velox, Cyko, Argo, and

Chloralla. Care should be taken to choose the particular variety of paper suited to the negative in hand, in order to secure the best possible print. Straight development methods only should be used, and clean gradation of tones from black to white aimed for, any suspicion of double-toning or "foxy" blacks being fatal to successful reproduction. It is by no means necessary to use glossy surfaced papers in all cases, although this particular variety will often give the most detail and the best surface for reproduction. Glossy or smooth print-out papers, such as Solio, are also used in the making of prints for reproduction purposes, but the use of development papers has almost completely supplanted these papers in recent years.

Mounted or Unmounted

Most editors prefer unmounted and untrimmed prints as allowing them a larger freedom in the treatment of the prints in reproducing them for this or that purpose. Perhaps trimming may be employed if the worker thinks that it will make his prints more presentable. Whenever it may be desirable to mount the print, a plain white or gray card, of medium thickness, is advised, with not more than one inch margin around the print.

The titling, stamping and addition of descriptive data to prints before submitting them to editors, with full details as to how to submit prints, how to pack and mail them, and the vitally important matter of copyright are all treated of in No. 120 of this series, "Marketing Photographs for Publication," and need not, therefore, be repeated here.

A Last Word

In these pages we have discussed the subject of photographing for the illustrated papers from the viewpoint of the man or woman who may take it up as a hobby or profession. Obviously, however, everything herein written applies to those who already have on hand a collection of miscellaneous subjects, many of which may be available for publication. The suggestions herein given will enable such readers to classify their available prints and prepare them for submission to possible buyers, of which a list follows:

Publications Which Buy Photographs

The following list gives the names and addresses of over a hundred papers known to buy and use photographs for illustration. As a general rule, it may be said that every publication carrying illustrations in its pages is open to buy illustrative material. In submitting prints, send all possible data with the prints, and inclose postage sufficient for the return of the prints if not used.

Agricultural Epitomist Spencer, Ind.	Agricultural pictures which teach a lesson.
American Agriculturist New York, N. Y.	Prints of live stock, farm homes and agricultural subjects.
American Art Works Coshocton, Ohio.	Photographic studies for calendar and novelty specialties.
American Blacksmith Buffalo, N. Y.	Prints of blacksmiths' shops and equipment.
American Boy, The Detroit, Mich.	Prints of any subjects interesting to boys.
American Cultivator 62 Summer St. Boston, Mass.	Agricultural and rural pictures. Farming operations. Pictures that a story can be written from.
American Golfer New York, N. Y.	Pictures of golfing subjects.
American Miller Chicago, Ill.	Pictures of mills of all sorts both new and in use. A short story with picture.
American Paint and Oil Dealer St. Louis, Mo.	Pictures of interest to paint dealers, manufacturers, jobbers, and painters.

American Printer, The New York, N. Y.	Photographs of unusual interest, preferably such as can be connected with the printing trade.
Anglo-American Post-card Publishing Co. 413 Broadway New York, N. Y.	Subject material for post-cards.
Architectural Record 11 East 24th St. New York, N. Y.	Landscapes; buildings of importance.
Art 334 Michigan Ave. Chicago, Ill.	Articles and pictures dealing with pure and applied art
Automobile Topics 1790 Broadway New York, N. Y.	Auto news, pictures; photographs of new engines and freak cars.
Barse & Hopkins 526 West 26th St. New York, N. Y.	Prints suitable for calendars, etc.
Beesham, I. 9 Bennitthorpe Doncaster, England	Photographs of women on horseback; cow-girls and similar subjects.
Bence Co., The E. S. Carthage, N. Y.	Manufacturers of calendars, souvenir post-cards, etc. At this time photographs of army maneuvers are desired.
Better Photos Sears, Roebuck & Co. Chicago, Ill.	Articles or photographs suitable for amateur photographers.
Boy's World, The Dew Drops The Mother's Magazine David C. Cook Pub. Co., Elgin, Ill.	The Boy's World wants pictures of subjects for general interest to boys between 10 and 16 years of age; pictures of children in action. The Mother's Magazine wants subjects on child life, home life, picnic parties, summer outings, table decorations, etc.
Breeder's Gazette, The 542 S. Dearborn St. Chicago, Ill.	Farm scenes.

Brown & Bigelow St. Paul, Minn.	Photographic subjects for art calendars, celluloid novelties, and cloth and leather specialties.
Building Age 239 West 39th St. New York, N. Y.	Illustrated articles suitable for paper, which see. Pays $8 per page for text and photographs.
Bureau of Practical Arts Grundmann Studios Boston, Mass.	Household arts, activities of women, particularly in the home.
Campbell Art Co. Elizabeth, N. J.	Prints of new and pleasing subjects for art reproductions and pictorial advertising.
Canadian Horticulturist The Peterboro, Ont. Canada.	Gardens and orchards; agricultural machinery at work most desired.
Celebrity Art Co. 36 Columbus, Ave. Boston, Mass.	Pictures suitable for calendars, motto cards, etc. Submit prints with return postage.
Cement Era, The 1207 Morton Bldg. Chicago, Ill.	Concrete work, either completed or in process of construction.
Cement World Chicago, Ill.	Cement manufacture and concrete construction, from the raw material to the finished product.
Central Press, The Cleveland, Ohio.	Pictures of persons and scenes which are mentioned in the news.
Century Magazine (Art Dept.) New York, N. Y.	Prints for illustration of articles in hand.
Christian Science Monitor Boston, Mass.	Articles, with photographs, concerning big engineering and public improvement schemes.
Colliers 418 West 13th St. New York, N. Y.	Pictures of current events that would appeal to people all over.
Combe Printing Co., The St. Joseph, Mo.	Country subjects.

Concrete, Cement, Age **97 Fort St., West** **Detroit, Mich.**	Three journals, and wants pictures of concrete roads and pavements, bridges, ornamental objects, fences, posts, etc.
Country Gentleman, The **Philadelphia, Pa.**	Prints of agricultural subjects; up-to-date farm buildings, etc. 6½×8½, $2 to $10 per print.
Country Life in America **Doubleday, Page & Co.,** **Garden City, L. I., N.Y.**	Farm scenes, gardens, country houses, live stock, poultry, dogs, outdoor sports, fishing, camping, etc.
Craftsman, The **41 W. 34th St** **New York, N. Y.**	Prints of various subjects.
Curt, Teich & Co. **125 W. Ohio St.** **Chicago, Ill.**	Subject material for post-cards.
Dew Drops.	See The Boy's World.
Dodge Publishing Co. **220 East 23d St.** **New York, N. Y.**	Water scenes in the nature of a stream or river; landscape and child studies.
Drysdale Co., The **209 South State St.** **Chicago, Ill.**	Publishers of Things Artistic. Photographs and original designs.
Edgell Co., The **13th and Hamilton Sts.** **Philadelphia, Pa.**	Photographs for illustrations, calendars, etc.
Electrical Review and Western Electrician **608 So. Dearborn St.** **Chicago, Ill.**	Subjects of definite relation to the electrical industry.
Engineering News **505 Pearl St.** **New York, N. Y.**	Accidents to engineering structures as soon as they happen.
Farm and Dairy **Peterboro, Ont.** **Canada.**	Farm and dairy scenes.
Farm and Fireside **Springfield, Ohio.**	Farm scenes and farm life.

Farm and Home Phelps Publishing Co. Springfield, Mass.	Farm scenes; farm folks.
Farmer, The Webb Publishing Co. 55 East Tenth St. St. Paul, Minn.	Pictures descriptive of farm life and accompanied by technical description of animals, plants or machinery represented.
Farm Press Chicago, Ill.	Prints of agricultural subjects.
Folmer & Schwing Division Eastman Kodak Co. Rochester, N. Y.	Graflex users can make money by submitting prints with these cameras. Subjects to use for advertising purposes.
Forest and Stream 127 Franklin St. New York, N. Y.	Shooting, fishing, yachting, canoeing, camping, mountaineering, etc.
Foster, Warren Dunham 194 Clarendon St. Boston, Mass.	Better living conditions.
Fruit-Grower and Farmer St. Joseph, Mo.	Orchards, gardens, fruits, etc.
Gardening Monon Bldg. Chicago, Ill.	Photographs of trees and flowers, 5×7, unmounted, packed flat.
Garden Magazine, The Doubleday, Page & Co., Publishers Garden City, N. Y.	Photographs of horticultura value.
Gilbert Post-card Co. 141 W. Ohio St. Chicago, Ill.	Subject material for post-cards.
Green's Fruit-Grower Rochester, N. Y.	Fruit trees, orchards, fruit-growing.
Grit Williamsport, Pa.	See paper for subjects likely to be acceptable.
Gutmann & Gutmann 24 East 21st St. New York, N. Y.	Subject material for post-cards.
Hannah, Henry King 277 Broadway New York, N. Y.	Write regarding pictures he wants.

Holland's Magazine Dallas, Texas.	Consult a file of the magazine.
The House Beautiful 315 Fourth Ave. New York, N. Y.	Architectural subjects.
House and Garden McBride & Nast Co. Publishers Union Square New York, N. Y.	Birds, insects, animals, nature-study photographs.
Housekeeper, The 443 Fourth Ave. New York, N. Y.	Pictures pertaining to the household.
Illustrated Outdoor World and Recreation 17 West 42d St. New York, N. Y.	Hunting, fishing and sports of all kinds, particularly action pictures.
Illustrated Review, The Chicago, Ill.	Industrial processes, showing men and women at work, from which stories can be written.
Independent, The 130 Fulton St. New York, N. Y.	Pictures of news interest or political value.
Inland Printer, The Chicago.	Needs same as American Printer, which see.
Inland Storekeeper Delhi, New York.	Shop-window displays, interiors, decorated floats of trade houses.
Insurance Engineering New York, N. Y.	Occasional articles with photographs. See the magazine for acceptable subjects.
International Publications Co. 44 Great Queen St. Kingsway, London England.	Any kind of photographs. Write, stating what you have, with particulars and prices.
Kropp Co., E. C. 258 Jefferson St. Milwaukee, Wis.	Subject material for post-cards.

Ladies' Home Journal The **Philadelphia, Pa.**	Always willing to consider photos submitted to editors for approval. If available for use will buy at prices varying according to subject, etc.
Leslie's Illustrated Weekly **New York, N. Y.**	Prints of news and odd subjects, 4×5 and larger, $3 and up per print.
Leslie's Weekly **225 Fifth Ave.** **New York, N. Y.**	News of interest or interesting scenes.
Life Publishing Co. **New York, N. Y.**	Prints only of subjects likely to be of special interest to readers of "Life;" size immaterial; payment varies.
Literary Digest **New York, N. Y.**	News photographs of unusual interest; size immaterial. $2 to $3 per print.
Little Wanderer, The **64 W. Randolph St.** **Chicago, Ill.**	A magazine for boys and girls. Photographs occasionally.
Majestic Publishing Co. **316 Newton-Claypool Bldg.** **Indianapolis, Ind.**	Original designs and texts for post-cards.
Metropolitan Magazine **286 Fifth Ave.** **New York, N. Y.**	Study requirements and correspond with art director.
Midland Publishing Co. **Grand St. and Morgan Ave.** **Brooklyn, N. Y.**	Photographs of comic and art subjects for post-card and booklet use.
Missouri Valley Farmer **Topeka, Kans.**	Prints of live stock and agricultural scenes in the middle West.
Modern Priscilla **Boston, Mass.**	Prints only, reproducing original patterns in different kinds of fancy needle-work, and photographs illustrating household articles.
Mother's Magazine	See The Boy's World.

Motor 381 Fourth Ave. New York, N. Y.	Pictures of motoring interest.
Motor Boat 1133 Broadway New York, N. Y.	Pictures of motor boats of all kinds.
Motorcycle Illustrated 51 Chambers St. New York, N. Y.	Motorcycles in action.
Musician, The Oliver Ditson Co. Publishers Boston, Mass.	Character in musical work; pictures that tell a story.
Myers Co., The Elwood Springfield, Ohio.	Buys photographs of various descriptions.
National Calendar Co. The, Suite 933 80 Maiden Lane New York, N. Y.	Purchase photographs of distinctive New York city scenes for calendars. Must be artistic and different from ordinary run of post-card pictures.
National Colortype Co. Cincinnati, Ohio.	Subject material for post-cards.
National Farmer and Stock-Grower, The St. Louis, Mo.	Prints of individual animals, live-stock companions.
National Geographic Magazine 16th and M Sts. Washington, D. C.	Native life; work and play; street scenes, atmosphere of the locality.
National Magazine Boston, Mass.	Articles with illustrations, manuscripts and pictures describing towns and states; farming regions, etc.
National Sportsman Magazine 75 Federal St. Boston, Mass.	Hunting and fishing scenes.
Nautilus and Health Magazine, The Holyoke, Mass.	Photographs occasionally to illustrate articles of social or or economic interest; designs for use at head of articles sometimes purchased from artists.

Nebraska Farm Journal Omaha, Nebr.	Prints of farm scenes and live stock in Nebraska.
Neue Photographische Gesellschaft Aktiengesellschaft Siemensstr, 27 Steglitz Berlin, Germany.	Photographic prints showing American subjects, landscapes, heads, scenes, ladies, children, animals, etc., for post-cards.
Newspaper Enterprise Association Chicago, Ill.	Photographs suitable for magazine and pictorial supplements of newspapers.
Noble & Williams Novelty Co. Box 173 Morsemere, N. J.	Pictures for blotters, advertisements and calendars.
Oakley, P. Benson Box 102 Norwich, N. Y.	Photographs of unusual events, aviation, fires, great disasters, floods, etc.
Outdoor Life New York, N. Y.	Usually buys illustrations with its manuscripts.
Outdoor World and Recreation 2 Duane St. New York, N. Y.	Odd and unusual outdoor material.
Outing Magazine New York, N. Y.	Prints of general outdoor subjects.
Outlook, The New York, N. Y.	News, scientific photographs, portraits, etc.
Perry, Wm. H. Lynn, Mass.	Photographs for calendars.
Photo News Service 136 West 52d St. New York, N. Y.	Photographs covering important news events if sent quickly after event, with descriptive matter. $5 to $1 for good prints.
Poole Bros, Railway Printers 87 Harrison St. Chicago, Ill.	Prints of recreative, travel or scientific character, with descriptive data.
Popular Mechanics 7 East 44th St. New York, N. Y.	Contractors write regarding work.

Recreation New York, N. Y.	Prints of outdoor recreation.
Rochester Photo Press Rochester, N. Y.	View subjects, rustic scenes, brook scenes, birch tree scenes.
Round Robin Reader Boston, Mass.	Subjects of interest to children; prints suitable for front cover designs.
Rural New Yorker 409 Pearl St New York.	Subjects of unique agricultural interest.
St. Nicholas New York.	Juvenile subjects; pictures illustrating descriptive, scientific or nature articles.
St. Nicholas Magazine Nature and Science Dept. Arcadia, Sound Beach Conn.	Novelty or beauty in realms of nature or science, inventions, etc.
Saturday Blade Chicago, Ill.	Curious or interesting scenes which would be of interest to its readers; description or explanation of each picture.
Saturday Evening Mail New York, N. Y.	Photographs of news subjects, well-known persons or scenes of special interest. Mark prints "not sent for competition but for acceptance on usual terms."
Scribner's Magazine New York, N. Y.	Prints of historical and geographical interest, portraits, sculptures and paintings.
Snelling, Walter O. Ph.D. 40th and Butler Sts. Pittsburgh, Pa.	Pictures of explosions and their results.
Sprague Publishing Co. Detroit, Mich.	Photographs of boy interest, or outdoor life, for boys of 9 to 18 years of age.
Star Farmer, The 716 Lucas Ave. St. Louis, Mo.	Farm scenes, clear figures, and plenty of human interest are most available.

Strand Magazine 85 Duane St. New York, N. Y.	"Curiosities," with brief description.
E. A. Strout 47 West 34th St. New York, N. Y.	Farm scenes, harvesting, children at play, boating, fishing and outdoor subjects, for advertising purposes.
Suburban Life 334 Fourth Ave. New York, N. Y.	Suburban or country life, flowers and gardens.
Successful Farming Des Moines, Iowa.	Farm scenes, farm buildings, farm machinery in use not with figures posed.
Sunday Globe Boston, Mass.	Articles and photographs of subjects relating to New England.
Sunset Magazine San Francisco, Calif.	Pacific coast scenes, also golfing, swimming, motoring, riding, camping, boating and all outdoor sports.
System Wabash and Madison Aves., Chicago, Ill.	Fiction scenes, business pictures.
Technical World Magazine 58th St. and Drexel Ave., Chicago, Ill.	Photographs with descriptions of discoveries and inventions that would appeal to the general public.
Tichnor Bros., Inc. 251 Causeway St. Boston, Mass.	Subject material for post-cards.
Town and Farm Cincinnati, Ohio.	Not at present time.
Travel 31 East 17th St. New York, N. Y.	Photographs of travel interest from all parts of the world; not smaller than 3¼×4¼, payment on publication, according to size reproduced.
Trucker and Farmer, The New Orleans, La.	Offers First prize $5, second $3, third $1.50 for pictures of agricultural scenes of the South. Offered every month.

Shaw Advertising Co., The 110 W. 3d St. Kansas City, Mo.	Photographs for calendar illustration and advertising novelties.
Voightlander & Sohn 240 East Ontario St. Chicago, Ill.	Marines, landscapes, pictures which illustrate the superiority of anastigmat lenses over those with which hand-cameras are usually furnished.
Wide World Magazine 8 Southampton St. London, England.	Pictures for "Odds and Ends" department, with short descriptive articles.
Woodward & Tiernan Printing Co. St. Louis, Mo.	Photographs for advertising purposes, calendars and souvenirs.
Yachting 141 West 36th St. New York, N. Y.	Marines, yachts, commercial boats, coast or water views.
Youth's Companion Boston, Mass.	Occasional prints suitable for its "Nature and Science" department.

PRINCIPAL ENGLISH ILLUSTRATED PAPERS

Write for particulars before submitting work.

Bystander, London, England.
Country Life, London, England.
Daily Mirror, London, England.
Daily Sketch, London, England.
Daily Telegraph, London, England.
Illustrated London News, London, England.
The Graphic, London, England.
The Sphere, 6 Great New St., E.C., London, England.
The Tatler, London, England.

Books and Prints

All books noticed in these pages may be obtained from the publishers of THE PHOTO-MINIATURE, and will be promptly forwarded, postpaid, to any address on receipt of the publishers' prices as here quoted.

Composition. A series of exercises in art structure for the use of students and teachers. By Arthur Wesley Dow. Seventh edition; revised and enlarged. 9½ x 11½ in. With many new illustrations and color plates. New York: Doubleday, Page & Co. Price $4, net; postage, 22 cents.

Here is a real book about a subject of vital interest. For some years past I have treasured an early edition of this work, as the clearest, sanest and most satisfactory teaching of composition within my knowledge. Although not written for photographers, and not concerning itself in any way with photography as a medium of art expression, it sets forth in the simplest and most direct way, with hundreds of illustrations, just those basic notions which every photographer should know about the putting together of lines, masses and tone (or color) values before attempting pictorial work with the camera.

The author has had twenty years' experience as painter and teacher, and at present is professor of fine arts in Teachers' College, Columbia University. The work here briefly noticed is based upon this experience, which has proved beyond question the soundness of the principles underlying his method, and abundantly justified its radical departure from the methods generally followed in schools of art.

This departure starts with the idea that composition is the fundamental process in all the arts, and that art should be approached through composition, rather than through imitative work; by acquiring, through exercises in progressive order, a working familiarity with art structure, which leads, naturally, to the appreciation of all forms of art and of the beauty of nature. It is a rational method and, in Mr. Dow's hands, as fascinating as it is reasonable. Such a method should appeal with peculiar force to the worker in photography, who is almost wholly dependent on the use of line and mass for the expression of his pictorial ideas.

The book is one which should be read and pondered over. I cannot too earnestly commend it to those who seek a real knowledge of composition. The publishers deserve much praise for the attractive arrangement, printing and illustration of the volume, all in pleasing harmony with the subject matter.

Moving Pictures: How they are Made and Worked. By Fred A. Talbot. 340 pages; illustrated; cloth $1.50, postage 16 cents. Philadelphia: J. B. Lippincott Company.

No man could wish for a more interesting story field than is contained in the title of this book, whether he be the writer or the reader thereof. It is matter for congratulation that Mr. Talbot has fully appreciated his opportunity, and has given us a story which "grips" as strenuously as any one of the "six best sellers" of fiction. Nothing seems to have been overlooked, from the first attempts to produce moving pictures in the zoetrope, or Wheel of Life, with which our ancestors were familiar, to the most recent use of moving pictures in entertainment, science, and education. The production, manipulation, and projection of moving-picture films is treated in detail, so that one closes the volume with the thought that there can be nothing more to be said on the subject until the wonderful talking pictures which are promised by Edison get upon the circuit.

Horgan's Halftone and Photo-Mechanical Processes. By Stephen H. Horgan. 234 pages; illustrated; cloth $3. Chicago: The Inland Printer Company.

At last we have a book about halftone and the other photo-mechanical processes written by a man who knows what he is talking about. Stephen H. Horgan came into the world of everyday work when modern wood engraving had reached its zenith. He was present at the birth of photo-engraving, and has taken an active part in the long-drawn struggle between wood engraving and photo-engraving in the world of reproduction and illustration. Apart from his own inventions and labors, he has personally known all the men who have made their names famous in this field since March 4, 1873, when the New York Daily Graphic published its first number, and startled the world with a daily paper illustrated throughout by photographic illustration methods. It would be difficult to imagine a man more completely equipped for the writing of such a book.

The scope of the work is best indicated by a brief resumé of its contents: Photolithography on stone and metal; Collotype; Photolithography; Swelled gelatine; Photo electrotype; Halftone process; Three-color and four-color block making; Photo planography for the offset press; Rotary photogravure, Facts for process photographers; Zinc and copper etchers; Pointers for photographers, Foremen, Journeymen and finishers; Negatives etched by hand; Screens and their care; A curious chapter headed Process-workers may be Jailed; Direct process with Norwich film; Key plates on zinc; A section devoted to weights and measures; Cameras, thermometer comparisons, etc., and a 23-page glossary of process terms, with a comprehensive index.

The volume is illustrated with examples of almost every known reproduction process, from an autochrome reproduction in three printings, by J. Horace McFarland, to a high-light halftone of 1880 and a halftone of 1868.

Apart from its historical features, the particular virtue of the book lies in the thoroughness of the author's treatment of the various processes. The reader is assured on every page that the writer has done the things he describes, and one marvels at the range of his experience. The volume, which has for its frontispiece a photogravure portrait of the author, will undoubtedly take its place as the standard text-book in its field.

Wild Life and the Camera. By A. Radclyffe Dugmore, F. R. G. S. 332 pages; illustrated; cloth, net $2. Philadelphia. J. B. Lippincott Company.

Those who have read Mr. Dugmore's earlier books, or have heard his lectures, or have met the man himself will welcome this new volume, which tells in intimate fashion of his experiences as a sportsman with the camera among the caribou in Newfoundland; of a porcupine hunt in the Adirondacks; with birds of all sorts in all sorts of places; with two 'possums and Dennis O'Connor in the Sunny South; with the whistling swan of Currituck Sound; of a fishing trip in the High Sierras of California after trout; of yellow-tail fishing off Catalina Island; of photographing sea trout in the rivers of New Brunswick; and salmon fishing in Newfoundland; and of his picturing of the tracks of wild animals in the snow during the winter months here and in Canada.

This is, to my mind, the best of Dugmore's books, so far. The children will enjoy it as much as their elders, and the pictures are quite as absorbingly interesting as the text. For the practical man, there are chapters on The Life of the Trapper and Camping for All Seasons, with which the all-too-short record closes. If you love the outdoor life, and especially wild life outdoors, get the book. You will enjoy it.

Notes and Comment

The story of the great Daily Mail Photographic Competition of last fall is interestingly told and illustrated in the February number of an English magazine, titled: London. The appeal of this competition, with its first prize of $5,000, was world-wide, and entries were received from almost every civilized country, the United States taking a very keen interest in the venture. Many thousands of sets of twelve photographs, illustrating a holiday, were received, and the task of judging was, as may be imagined, at once laborious and difficult. The five-thousand-dollar prize was won by Douglas A. G. Brown, London, and his pictures, as reproduced in the article mentioned above, are delightfully alive with the true holiday spirit. There is an atmosphere of joyousness about every one of them. Anyone looking at these pictures cannot help but remark, "What a jolly time they must have had!" Mr. Brown used a 3A Folding Pocket Kodak in making the pictures which secured for him the coveted award. Among the smaller prizes, one was awarded to D. Van Deventer, of Winona Lake, Indiana, who used a Century camera in his work.

It is a pleasure to praise good work. Some time ago a friend in France sent me an under-exposed and under-developed film, showing an ancient coat of arms, which it was desired to reproduce in halftone. The negative was hopeless. Not having the time to fuss with it, I sent the negative through to Miles Greenwood, Melrose, Mass., asking his expert help. Within three days Mr. Greenwood returned the negative to me carefully and cleverly intensified, and four thoroughly satisfactory Velox prints, his charge for the service being best described as absurdly reasonable. There is a hint here for any reader who has a hopeless negative of a subject worth reclaiming.

So many practical conveniences and so much satisfaction and accuracy attach to the use of tablet chemicals that I sometimes wonder why amateurs use any other form where tablets are available. But the fact remains that the photographic tablet is by no means so widely known or appreciated as it should be, considering the advantages offered. The reader who would like to experience for himself the simplest, the surest, and most economical way of reaching results in his photographic manipulation, once past the problem of exposure, should send to Burke & James, Inc., Chicago, for full information about their Ingento Tablets, which cover almost all photographic manipulation, and may, by a slight stretch of the fancy, be extended even to the framing of pictures by the use of the Ingento picture mouldings, which come in cut sizes ready for making into frames.

Mr. W. J. Fuller advises us that he has purchased the interest of his late partner, Mr. Henry D. Marks, in the photographic supply business so long conducted under the firm name of Marks & Fuller, Rochester, N. Y. We wish Mr. Fuller every success in his reorganization of this old and well known firm, which has, during so many years, given good service to the amateurs of the Kodak city.

The 1913 Kodak Advertising Contest is announced with $3,000 in cash prizes. There are three classes in the competition. The Grand Prize Class, with a first prize of $500, and a second prize of $400, is open only to professional photographers who have won prizes in the professional class in previous Kodak advertising contests. Class A, for professional photographers only, offers prizes ranging from $500 to $100, with a total of $1,400; winners in 1907 and in Class A 1908, 1909, 1910, 1911, not being eligible in this class. Class B, for amateurs only (negatives 4 x 5 or 3 ¼ x 5 ½ or larger), with five prizes ranging from $300 to $50, with a total of $700. The descriptive circular, giving full details of the competition, may be had from any Kodak dealer or the Eastman Kodak Co., Rochester, N. Y. The competition is one which should have the careful consideration of all the readers of THE PHOTO-MINIATURE.

An exposure help which is bound to win instant popularity is the Six Fax Exposure Disc, just introduced by Burke & James, Inc., of Chicago, at 25 cents. This little disc of celluloid, which fits the waistcoat pocket, is based upon the six essential factors of all exposures. Once the dial is set for the time of day and year, a single turn gives the correct exposure for any exposure with any size stop, whether expressed in the F or the Uniform System. At the same time, the correct exposure with all stops is shown on the disc, giving the worker a choice of the stop best suited to the subject. There are no tables to consult and no calculations to be made. It is a little wonder.

During the month of March, a very interesting exhibition of photographs was held in the art gallery of the great store of John Wanamaker, Philadelphia. The catalogue shows a total of almost two thousand prints by almost four hundred exhibitors, among whom I note, with pleasure, many subscribers to THE PHOTO-MINIATURE. The first prize of $100 went to Annie W. Brigman, Oakland, Calif.; the second prize of $50 to Raymond Pitcairn, Philadelphia; the third prize of $25 to John N. Brown, Ogdensburg, N. Y., and the fourth prize of $15 to Jack Rivers, New York City. Apart from these, some fifteen other prizes were awarded. In addition to the pictures in the competitive section, there was also shown a special loan exhibit of portraits made by Rudolph and Minya Diez Duhrkoop, Hamburg and Berlin.

In the foreword to the catalogue, Alfred Stieglitz tells us that "The judges of the Competition were unanimous in condemning all such pictures in which imitation of painting was the keynote. Photographers must learn not to be ashamed to have their photographs look like photographs. A smudge in "gum" has less value from an esthetic point of view than an ordinary tintype. . . . A photographer using photography to do a "stunt," or to imitate painting, may amuse those who understand neither the fundamental idea of photography nor the fundamental idea of painting." This is a word worth keeping in mind.

I believe that W. A. Bell, the manager of the photographic department, deserves the credit for inaugurating and carrying through these Wanamaker exhibitions, which have done much to stimulate the use of the camera by eastern amateurs.

With the first touch of spring, amateurs everywhere take down the camera from its winter shelf. Of course it should never have gone up there. But with the spring it is taken down and made ready for outdoor work. Let me whisper one word in your ear which will serve as a keynote for this year's work: Get the color values. This means the use of plates or films which have the orthochromatic quality. Last fall I had splendid results from Ensign films in this matter of keeping the delicate color luminosities in my outdoor work, and would advise a trial of these films during the days of the early spring.

While on this topic of color-reproduction by photography, I must not forget to mention a booklet, "Color Plates and Filters," just issued by the Eastman Kodak Company, Rochester, N. Y., for professional and commercial photographers. There is little in this brochure which concerns the amateur's use of the camera, but the reader who occasionally tackles a really difficult bit of work, such as photographing woods, furniture, tracings on discolored papers, documents, and the like, can secure in this little book a vast amount of special information. Unless I am mistaken, the booklet is the first publication of the new Science Laboratory of the Eastman Kodak Company, which is under the direction of Dr. C. E. Kenneth Mees.

It goes without saying that the use of ortho plates or films without the color screen on the lens is only going half way toward success. The delusion is current that the use of the screen multiplies the exposure beyond reasonable limits for snap-shot work. There is a suggestive article on this point, "Color Values and the Ray Screen," in the March number of the *Ingento Photo News*, which my readers can get from Burke & James, Inc., Chicago, for the asking. It is worth reading through.

The enthusiastic appreciation given to THE PHOTO-MINIATURE No. 119, *Optical Lanterns and Their Use*, shows me that amateur photographers are giving more attention to the pleasure possibilities in the use of the lantern. This is a field which has been too long neglected. There is endless usefulness and fun in the possession of a lantern, and it need not be either an expensive or a complex instrument at that. Let me persuade the reader to get the new catalogue just published by the Victor Animatograph Company, Davenport, Iowa. It is an eye-opener. I saw the Victor in action a few weeks ago, and cordially commend its simplicity and efficiency. For use in the home or in the school or lodge, as well as in larger auditoriums, the Victor is fast supplanting all the older and less compact instruments. When writing, ask about the "special trial-order plan," and also for particulars of the new Victor enlarging lantern.

The convenience and efficiency of photography as a recorder is nowhere more intelligently recognized than in engineering and surveying. The engineer who uses photography is necessarily obliged to get down to an exact system, calling for portability of equipment, simplicity of method, and efficiency in results. A great many amateurs could benefit by the adoption of such a system. To these I commend a careful reading of the paper on "Equipment for District Photography," by Capt. W. G. Caples, U. S. A., which appears in No.

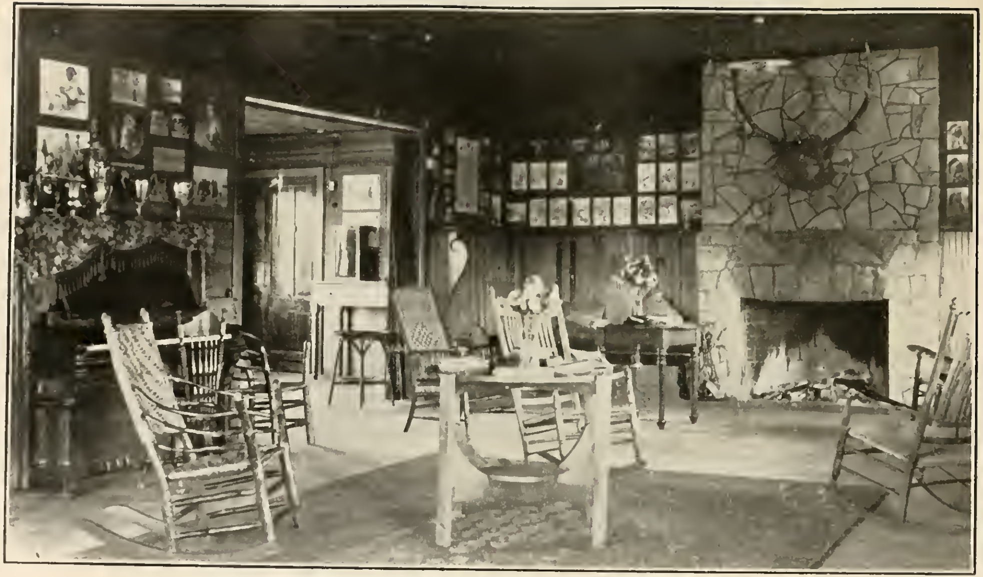
20, Vol. 5, of "Professional Memoirs," published by the Engineers School, Washington Barracks, D. C. In this paper, which is interestingly illustrated, Captain Caples particularizes the equipment required for survey work along the lines above indicated. In reading his paper, I note that at every turn the writer expresses his preference for the cameras and lenses made by the Goerz American Optical Company, basing this preference upon thorough tests. In speaking of the Goerz "Manufoc-Tenax," he says: "Simplicity, rigidity, durability, and adaptability, the essentials of a good camera, are the salient features of this instrument, and it is the only one offered which meets all these conditions." Of the Goerz Dagor he says: "The lenses proposed have been selected after a comparative test of several leading makes. These tests indicate that, while all confirm their maker's ratings, these lenses have the maximum covering power, and uniformly exceed the cautious rating given by their makers."

The Ansco Company, Binghamton, N. Y., wish to secure twenty-four unusually good negatives between now and May 1, for use in their 1913 advertising. For these they offer to pay sums ranging from $200 to $10. The judges as to the best pictures are Wilfred A. French, Frank R. Fraprie, W. I. Lincoln Adams, and a representative of N. W. Ayer & Son. Those interested can secure the circular of particulars on application to the Ansco Company.

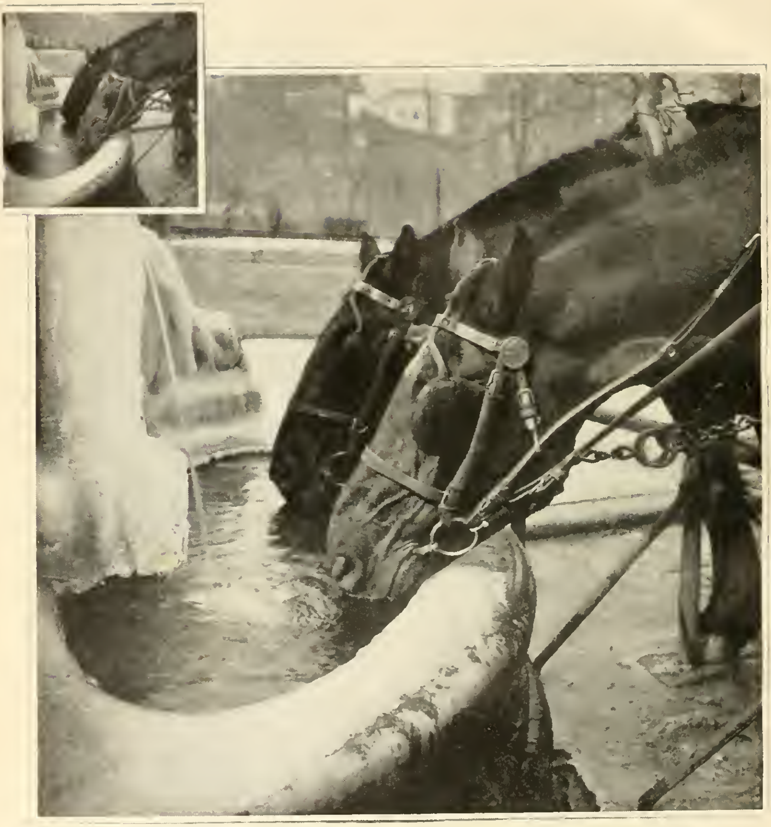
The first of January may be all right as the Day of Good Resolutions for the average man, but the first spring day is the day for resolutions by the amateur photographer. Here is a resolution worth while for 1913: "I will get one print from every good negative I make this summer into an album." You cannot appreciate the pleasure and satisfaction there is in the album habit until you have both the album and the habit. Every amateur knows how impossible it is to keep a set of one's prints. They get away from one in a thousand different ways. And duplicate prints for one's own set are among the things we put off from day to day. Years ago I formed the habit of irremovably fixing the first good print from every negative worth while into an album, and no book (or rather, set of books) on my book-shelf gives me more pleasure than these records of splendid hopes that fell short very often, but here and there reached my ideal. Ask your dealer to show you his line of Royal albums. Be good to yourself and insist on Royal albums. The majority of albums offered to amateur photographers are unworthy of any name, but the Royal albums are all that their name implies. If your dealer does not carry them, ask the F. L. Schafuss Company, 200 Fifth Avenue, New York, and mention THE PHOTO-MINIATURE.

The best sort of trade catalogues, and the sort I prefer, is that which gives a lot of information apart from technical specifications and prices. Such a catalogue is the Projection-Apparatus list, published by the Bausch & Lomb Optical Co., Rochester, N. Y., which gives one quite an education in optical projection and the evolution of the lantern for lantern-slide, opaque, microscopic, vertical, polariscopic and spectroscopic projection. Like all the catalogues issued by this well-known firm, its projection-apparatus list is well arranged, well printed, and abundantly illustrated. It is encyclopedic in its detail, and covers the whole gamut of projection work.

Burke & James, Inc., Chicago, have just placed on the market a new pocket camera, the No. O Folding Ingento, a roll-film camera, making pictures 2¼ x 3¼. This is the first of a complete line of film cameras which Burke & James will place on the market this year. As the April number of THE PHOTO-MINIATURE is to be wholly devoted to the pocket camera and its advantages, I will say no more here about the No. O Folding Ingento, except to suggest that the reader should send to Burke & James for the booklet of particulars.



From an Ansco pocket-camera negative



The small print in upper corner is from a negative made with an Icarette camera, 2¼ x 2¼ in. with a Series IIB Carl Zeiss Tessar lens, F6.3, exposure $\frac{1}{50}$ sec. in February. Larger print is from an enlargement 8 x 8 in.

Harold M. Bennett

The Photo-Miniature
A Magazine of Photographic Information
EDITED BY JOHN A. TENNANT
Volume XI APRIL, 1913 Number 125

Pocket-Camera Photography

In spite of all our real and boasted progressiveness, we Americans are behind the Old World in some things —to our loss. Pocket-camera photography is one of these things in which we lag behind. With us, as yet, the pocket camera is a novelty of little importance or significance, and generally regarded as a toy by our manufacturers and dealers. As one of these said to me a few days ago: When the American buys a camera, he wants as much camera as possible for his money. I think he was mistaken. The American is wide awake to the special worth of efficiency without useless bulk. In Europe the possibilities of the pocket camera were recognized years ago, and its development has been vigorously pushed, as the surest way of extending the usefulness of photography. As one consequence of this, while we today have hardly a dozen pocket cameras, appropriately representing our lack of foresight, European manufacturers are flooding our home market with over a hundred different varieties, appealing to every taste and purse. And, in spite of the opinion quoted above, and the fact that our American camera manufacturers are busy and prosperous, these foreign-made pocket cameras are selling so largely that the importers find difficulty in keeping up with the demand. In the current phrase: "There's a reason." The sight of so much camera efficiency and picture-making ability compacted into so small and convenient an instrument is irresistible. To see one is to want it. The higher the price and the smaller the camera, so much the more does the average individual want to buy it.

From an Icarette camera negative, 2¼ x 2¼, made with pocket flash-lamp, in the passage of a Pullman car, on a train going fifty miles an hour. The figure at the left is Otto Goerz, on the right, J. L. Lewis. Other New York dealers make up the group.

Harold M. Bennett

What the Pocket Camera Means

The pocket camera means all sorts of interesting things. It opens up a new chapter in photography, even to the blasé amateur or professional who, like the writer hereof, is already familiar with the whole story. More than that, it opens up a world of new interest and pleasure to the thousands and tens of thousands who love this kaleidoscopic life of ours, but who have never known the joy of making just the pictures of life they wanted for themselves, because this meant the learning of a lot of things for which they had no time. As a brother editor said to me a few days ago: "I have had a hand camera for years, and half a dozen as fine boys and girls as a man could desire, but I don't get pictures of them. The camera would do the work all right, if I had only the time to learn to use it and could make the pictures whenever I see them." This is just what the pocket camera means, what Everyman wants: the ability (in the camera) to get pictures of anything and everything, anywhere and everywhere, without bothersome preliminaries or the bother of learning how, and with little or no liability of failure and disappointment.

This may read like exaggeration, but it is sober fact, as Everyman may find out for himself by putting it to the proof. Not that all these wonderful things are possible with any and every pocket camera in the market; but certainly with some of them, as we shall see in later pages. The pocket camera is a dream come true.

Compared with the Hand Camera

How does the pocket camera justify these seemingly extravagant claims? Have we not had small hand cameras for years past? We have. Compact, convenient and efficient? Yes. There is no questioning here of the capacities of the hand cameras of today. The point is that their efficiency and usefulness are limited by conditions, while the pocket camera offers an equal efficiency, with a much wider range of usefulness, practically free from limitations—if we get a camera of the better sort. Small as the hand cameras are, they have to be carried in the hand, or slung across the shoulder, or packed into a handbag. Whether in actual use or not, they demand separate consideration, like a valuable umbrella, and are liable to get lost, strayed or stolen if momentarily put down anywhere. And, the greater their photographic efficiency, the greater the necessity for care and thought in their use, the automatic simplicity of the cheaper models merging into complexity of movements as the price advances. For these and other seasons, as Everyman knows, the hand camera has often been left behind when most wanted; and often, too, proves itself the camera of promise, with lots of failures in place of performance, due to the user's lack of familarity with its complexities or want of skill in its manipulation.

Why the P. C. Gives Results

The pocket camera is the camera of fulfilment—of results; not only because, as a pocket camera, it is the camera on the spot all the time, *plus* the actual ability to get the picture or record, practically regardless of the many conditions which militate against the universal or successful use of the larger hand camera; but also because it is, by its construction, so largely automatic in its operation, and so little dependent on the thought and skill of the user, so far as the quality of the result is concerned. Read that again, carefully, and get it.

The pocket camera will do all that the biggest and best hand camera will do; but without the bothersome bulk of the bigger camera, without its depressing weight, without the tedious preparation involved in the use of the larger camera and its impedimenta, without so much risk of failure and, of course, without the expense inevitably connected with the use of a camera twice or thrice its size. In a word, the pocket camera means the maximum of picture-making ability, in your pocket, ready for use whenever you need it, at a fraction of the expense of the larger hand camera of equal capacity and efficiency.

All-the-time Capacity

This all-round capacity of the pocket camera is largely based upon, and intimately bound up with, its smallness, its lack of size and bulk. You can get equal efficiency in

From an Ansco pocket-camera negative

From an Ansco pocket-camera negative

From an Ansco pocket-camera negative

the larger hand camera, of course, but with more trouble to get an equal number of successful negatives, and the very size and bulk of the larger camera will materially narrow the range of its usefulness. It is this all-the-time readiness, all-the-time efficiency, and all-the-time simplicity of the pocket camera, which make up the dream, come true. I did not realize it myself until I had put it to the proof. Then the plain fact was there, beyond dispute. I could carry in my pocket the ability, capacity, power, call it what you will, to get a photograph of anything, anywhere.

From an Icarette camera negative, 2¼ x 2¼. Made with camera in one hand and pocket flash-lamp in the other
Harold M. Bennett

Multum in Parvo

It may be argued that the pocket camera pictures are small—too small to have much interest. This argument has little real force. The advantages of the greater convenience, the possibilities of a much larger use, and the automatic efficiency of the pocket camera more than compensate for the lack of size in the resulting picture. An album of pocket-camera pictures is mightily interesting. And it is so easy, today, to get the best of the little pictures enlarged when this seems desirable. And the quality of the pocket-camera negative is such that you cannot distinguish the enlargement from an original print of the same size. This is illustrated in the frontispiece of this number, which reproduces an enlargement 8 x 8 inches from an original 2 x 2 inches, shown in the upper corner.

From an Ansco pocket-camera negative

Simplicity of Operation

Let me emphasize the point of simplicity as peculiar to the pocket camera. There are many kinds of pocket cameras, ranging in price from $5 to $105. In the best of them we have the maximum of efficiency combined with the minimum of possibility of failure, and the advantage of almost automatic operation. Even in the cheapest of them we have the last two qualities, which spell simplicity, though the low price may mean limitations in the range of possibilities. So cleverly are these desirable qualities combined, whether we secure only two or all three of them, that the pocket camera will do its work equally well in the hands of the boy or girl at school, for the woman in the home with the children, for the man in his every field of work and pleasure, at the auto meet or motorboat race, for the business man at his conventions, or wherever men meet for pleasure or business, for the holiday near home or overseas, for the factory manager who wants shop records, for the contractor, surveyor, or engineer who wants details of the progress of construction work, and for the scientist or artist at home or afield. It is the best of notebooks for the traveler. It offers a lot of pleasure, and not a few chances of profit, to the professional or commercial photographer, as an adjunct to his more serious work. For the specialist in a hundred lines, where the larger hand camera offers difficulties, the pocket camera has an almost illimitable usefulness. And all this by reason of the fact that it can be carried unconsciously, in the pocket, and is equal in efficiency, simpler and surer in use than the larger hand camera.

How it Works

So simple and so sure is the pocket camera in use that I hesitate to write even a little book about it, lest, by spreading it over page after page, I seem to make it look difficult and complicated. So the reader must take all that follows simply as a friendly chat about pocket-camera photography rather than as a formal instruction book, for which there is no need. You cannot make the pocket camera difficult or complex. Once you know how to load it with plates or film and to open it, all you have to do is to point it at the subject from the most favorable viewpoint available, see the subject in the finder, and press the shutter release. That is all. You have the picture. Change the plate or film, fold the camera and put it in your pocket, and forget it until you need it again. If the subject should be a happy party at a restaurant table, a group of girls at a dance, or a portrait at home during the evening, you will need Caywood's pocket flash lamp to help you, which, by the way, is little larger than a pencil. But, day or night, there is no bother, no difficulty, no lugging around of a five-pound box for hours, no staring crowd attracted by your preparations, no camera-carrying consciousness, no useless wishing: "Oh, if I only had my camera with me." You can always have the camera with you, in your pocket, ready for use, and you get the picture every time.

And Afterwards

After the pocket camera has given you the picture or record, which is the vital and important thing, you can still have all the other pleasures of the oldtime photography; the excitement of developing the pictures, or the quieter joys of printing and making enlargements. Referring here again to the smallness of the pocket-camera picture, those who can recall the delightful little pictures shown by Mr. W. J. Mullins at recent photographic exhibitions know full well that one can express quite as much of skill, and truth, and loveliness in a print measuring 2 x 3 inches as can be compressed into a 16 x 20-inch enlargement from the same negative. Working with a pocket camera will teach you the subtle mysteries of size and proportion in picture-making, the beauty of the wealth of detail in the miniature, and the satisfying breadth and vigor found in the large picture. As a matter of course, the pocket-camera worker is bound to familiarize himself with the process of making enlargements, i.e., the production of prints from 3½ x 5½ to 10 x 12 inches from his small negatives. Enlarging used to be thought a difficult process, but now, with our modern development papers and simple daylight and electric-light enlargers, there is far more fun and satisfaction in making enlargements than most of us appreciate. Much of the efficiency of the pocket camera is provided to meet this likelihood of its little negatives being used to make enlargements. Of this, more later. If you are a busy man, as I am, and cannot spare time to "do the rest" for yourself, your nearby dealer will do it for you. Or you can follow my simple method, which is to mail the exposed films to Miles Greenwood, of Melrose, Mass., who will do whatever you want done quite as well as you could do it for yourself, and at a trifling cost.

What Lack of Bulk Means

Now let us see how and why the pocket camera means so much more than we get out of the average hand camera. Its greater convenience and wider usefulness, its all-the-time readiness for picture-making, is due largely to its small size and lack of bulk or weight, its extreme compactness and portability. We have coat-, hip-, vest- and even watch-pocket cameras, and, of course, all these are small enough for the ladies' wrist-bag. So long as the camera will go, easily and without inconvenience, into the pocket or wrist-bag, there is no practical advantage in using the smallest size obtainable. The larger the picture, without inconvenience in carrying the camera, so much the more pleasure.

From an Ansco pocket-camera negative

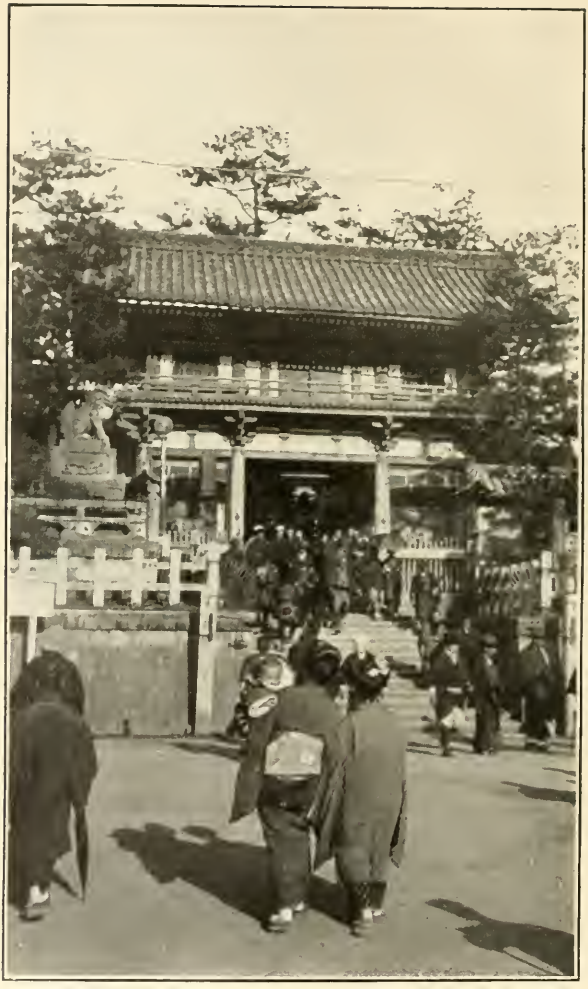
will we have in the prints, and the less chance will there be of obtrusive grain in the enlargements made from the negatives. To be able to have the camera all the time, without being conscious of carrying it and without its being in the way when not in use, is the big advantage which will enable us to get many subjects which would otherwise be lost for lack of camera. It also means that we can make double the usual number of exposures on a trip, without encumbering our pockets at all. Especially does it mean that the camera will be vastly useful to those who want records of work and life outdoors, where the use of the larger hand camera would interfere with other and more serious duties.

Question of Expense

Another advantage peculiar to the pocket camera is the smaller expense of its maintenance. With plates costing twenty or thirty cents per dozen, and films costing very little more, one can indulge in three exposures with the pocket camera at the cost of a single exposure with, say, a 4 x 5 or 5 x 7 camera. For comparison, let us take Jones, using a 5 x 7 hand camera, and Smith, with a pocket camera for pictures 1¾ x 2¼. The cost of the 5 x 7 filmpack is $1.60; developing the twelve films, 40 cents; twelve unmounted prints, $1.20; total, $3.20. The cost of three 1¾ x 2¼ filmpacks is 75 cents; developing the 36 films, 45 cents; 36 prints, $1.80; total, $3.00. But this is supposing that Jones and Smith get twelve good negatives out of every dozen exposures, which rarely happens; and that Smith is as completely satisfied with his little pictures as Jones is with his 5 x 7 prints. Let us make another cost comparison on the basis that each man gets eight good negatives per dozen exposures, and that Smith wants a few of his best enlarged to match Jones's 5 x 7 prints. Here Jones gets his eight 5 x 7 prints at a cost of $2.80. Smith can still get twice as many pictures as Jones, using two twelve-exposure filmpacks, i e., get sixteen prints from his good negatives and four 5 x 7 enlargements at 30 cents apiece, all within the $2.80. Am I mistaken in thinking that the average man will prefer the fun of twenty-four exposures, with sixteen desirable prints and four good 5 x 7 enlargements, to twelve exposures and eight 5 x 7 prints, the

Enlarged from an Ansco pocket-camera negative, fitted with Bausch & Lomb Tessar Ic.

Mrs. Ethel Grant Scott



Enlarged from a Goerz V. P. Tenax negative, 1¾ x 2$\frac{15}{16}$ in., and demonstrating the fact that 5 x 7 enlargements from pocket-camera negatives cannot be distinguished from contact prints from original 5 x 7 negatives.

cost being the same in either case? And there is no doubt at all about the man with the pocket camera having much less fuss and trouble than the other man burdened with the 5 x 7 camera.

About Results Again

There is still another advantage connected with the smallness of the pocket camera. Most subjects out-of-doors include movement of some sort, and, unless we can get the subject without blur or movement showing in the picture, it is useless to waste a film in the attempt. Now the image of a moving object has to travel twice as fast to get across a 5 x 7 plate in a given time as it has to cross a 2½ x 3½ plate. This means that with the 2½ x 3½ or pocket camera we can stop the motion in a subject including rapid movement; that is, get a picture without blur or movement showing, with an exposure of 1/50 of a second, where we would have to give an exposure of 1/100 second with the 5 x 7 camera. Now think how often the 1/50 of a second exposure would mean a good negative, where the 1/100 of a second exposure would mean hopeless under-exposure or failure, and you will see the force of this advanatge. This is one of the many reasons why the pocket camera is the camera of results.

The Biggest Advantage

But there is another advantage peculiar to the pocket camera which outshines all the others, viz., the wonderful way in which it combines lens rapidity (which means the ability to get good negatives with extremely short exposures, or under difficult light conditions), with depth of focus (which means the ability to give pictures in which near and distant objects are clearly and sharply defined). As Everyman knows, these two very desirable qualities do not travel together in the larger hand camera. Let me try to explain how they are combined in the pocket camera, and what their combination means in everyday work.

What Lens Rapidity Means

The rapidity or speed of a lens is measured by the relation between the size of its largest aperture or "stop" and the focal length of the lens which, roughly, is the distance between the center of the lens and the picture image on the plate or focusing screen when a distant object is sharply in focus on the screen. In pocket cameras, the most rapid lens as yet available has an aperture which is about one-fourth of its focal length. This is expressed by the figure *f*/4, or U. S. 1, according to the system of numbering employed by the maker. With every lens is supplied a series of apertures or "stops," as they are commonly called, and these apertures are usually graded in size, from the largest to the smallest, so that each succeeding aperture is half that of the aperture preceding it, and requires double the exposure which the preceding larger aperture would require. In practice, the series of apertures and the corresponding ratio of exposures required is arranged as follows:

U. S.	1	1¼	2	3	4	8	16	32	64
F No.	*f*/4	*f*4.5	*f*/5.6	*f*/7	*f*/8	*f*/11	*f*/16	*f*/22	*f*/32
	1		2		4	8	16	32	64

From this table we get an idea of the comparative speed value of different lenses from the viewpoint of exposure. Thus we see that, with a given subject, the rapid lens with an opening of *f*/4.5 will give us the picture image in about a quarter of the time required by the lens of medium rapidity with an aperture of *f*/8, and in one-eighth of the exposure time required by a lens whose largest aperture is *f*/11; which, by the way, is the largest aperture available in the cheapest models of the pocket camera. Fortunately the majority of subjects photographed by amateurs are secured under such favorable light conditions that good negatives are possible even with a lens of such limited speed as *f*/11 and *f*/16. But it will be obvious to the reader that, with a lens working at *f*/4.5, the chances of success are enormously increased; and we can photograph at times and under conditions when good negatives would be quite impossible with a lens requiring exposures eight or sixteen times longer than those possible with the rapid lens.

Depth of Focus

The getting everything clearly and sharply defined in the picture, as Everyman puts it, depends on the "depth of focus" of the lens. This term expresses the ability of the lens to give a sharply defined image of near and distant objects. Theoretically, a lens can form a sharply defined image only of objects at one point, or, as we say, lying in one plane, in front of it. But, practically, the lens gives a sufficiently sharp image of objects somewhat in front of and behind this point or plane of critical focus or definition. The range of this distance is spoken of as the depth of field, or depth of focus, of the lens. This depth of focus depends on the relation between the focal length of the lens and the aperture or stop used with it. Generally speaking, it increases as the focal length of the lens and the size of the aperture decrease. Thus, of two lenses of the same speed, but unequal in focal length, the lens of shorter focal length will give the greater depth of focus. This explains why a 5 x 7 enlargement, made from a pocket camera negative, with a three-inch lens working at *f*/4.5, will have more depth of definition than a 5 x 7 contact print from a negative made with a hand camera fitted with a seven-inch lens working at the same speed, viz., *f*/4.5. It also explains why the pocket-camera lens, regardless of the aperture or stop used, gives pictures with greater depth of definition than those made with the larger hand camera where the same apertures are employed, but with a lens of greater focal length.

An Example

For example: A lens of six inches focal length, if focused on an object fifteen feet away, with aperture *f*/4.5, will sharply define objects lying between fourteen and sixteen feet away from the camera. Here the depth of focus is seen to be extremely limited, not more than two feet. All objects nearer than fourteen feet, or beyond sixteen feet away from the camera, will be more or less out of focus, i.e. not sharply defined. If, on the other hand, we use a lens of three inches focal length, at the same distance and with the same aperture, then all objects lying between ten and twenty-four feet away will be sharply focused. The gain in depth of focus so gained is the difference between two feet and fourteen feet. The figures here given are based on a confusion disc of 1/250 of an inch, as best suited in the making of small negatives for after enlargement. If the usual disc of confusion, viz., 1/100 of an inch had been employed, the depth of focus available in each case would be greater, but the proportions would be the same.

Fixed-Focus Advantage

The advantage of the pocket camera in giving pictures in which everything is clear and sharp, as the phrase goes, is still more apparent when we remember that most pocket cameras are adjusted to work at the so-called "fixed focus." This means that the lens is fixed at, or is generally adjustable to, that point at which it will give everything sharply defined which lies more than five or six feet away from the camera. This adjustment is based on what is known as the "hyperfocal distance," i.e. the distance from the lens beyond which all objects will be in fairly sharp focus, and which gives the maximum depth of definition in the picture. This distance varies with the focal length of the lens and the stop used. In practice, it means that with a lens of three inches focal length, such as is fitted to many pocket cameras, everything beyond ten feet away will be sharply focused with an aperture of *f*/4.5; beyond five feet away, with aperture *f*/8; and beyond three feet away, with aperture *f*/16.

Summing Things Up

Here, then, we have seen why the pocket camera must give a larger proportion of successful negatives than the bigger hand camera in the hands of the average man. This means not only a greater satisfaction, but also a greater economy in its use as compared with the larger hand camera. The initial expense in the purchase of the outfit may not be smaller than with the larger hand camera, that is, if the reader wisely chooses a pocket camera with an anastigmat and a high-grade exposure shutter; but the expense of up-keep will be much less, and there will be fewer failures (the principal source of expense in photography), and a much greater proportion of successful negatives. In other words, the pocket camera means better results, more satisfactory negatives, with fewer failures and less waste than the larger hand camera. And, quite apart from all this, the portability, simplicity, and efficiency of the pocket camera combined so extend the range of possible subjects, and the times and conditions when we may photograph, that we are practically freed from the many limitations which have prevented the general use of photography as a means of obtaining records or pictures whenever needed or desired.

A Lens Hood

Strange though it may seem, one of the most important points in the securing of crisply brilliant negatives with the pocket camera is not touched upon in any of the articles I have seen dealing with the subject. The necessity for compactness in the pocket camera has resulted in a method of mounting the lens so that it is practically flush with the front of the camera in almost every model I have seen. This means that the lens, in this class of cameras, has to do its work without any protecting flange. When it is remembered that the modern anastigmat is made to cover a fairly wide angle of view and is of short focal length with a large aperture, it will be seen that this combination needs, most of all, a protecting flange or some sort of shade or hood over the front of the lens, in order to avoid flare, and that general veiling of the plate or film which inevitably results from scattered light reaching the lens from every direction. Flat and foggy negatives may result from photographing against the light, from over-exposure, from a misty condition of the atmosphere at the time of photographing, and from the use of a warm developing solution, or a developer too strong in alkali, or from the lack of a safe light during development. But it is probably true that more flat and foggy negatives result, in modern hand-camera work, from the lack of a lens hood than from all these causes put together

How to Make One

Any device which will shade the lens from excessive light impact, without cutting into the field of vision of the lens, will serve as a lens hood. A collapsible circular hood formed by two thin brass tubes sliding within each other, the rear tube fitted so that it will just snugly hold to the slightly projecting lens flange on the camera front, and both tubes coated with dead matt varnish inside, is one of the best forms I have seen. Such a tube was marketed by Nicholson some years ago, and may perhaps be obtainable still from some dealers. The square folding-box-form hood, made for use with the telephotographic lens, is another good form, common in England, and possibly obtainable here. A temporary hood may be constructed with cardboard tube or a small square card box, if nothing better is available. The point is to use the hood whenever photographing out-of-doors. If the reader will make a simple experiment by exposing two plates on the same subject from the same point of view, the one with the lens unhooded and the other with the lens hooded, he will at once see the advantage of the hood and use it in all his outdoor work, whether with pocket cameras or larger cameras. When a hood is not available, the lens may be shielded with the hand during the exposure, but this depends upon the ability of the worker to hold the camera and operate the shutter release with the other hand alone, which requires a little dexterity and practice. Mr. Harold M. Bennett, an expert in pocket camera work, tells me that he invariably employs this simple method of hooding the lens, and that "it works" even when photographing against a strong light.

Development: Roll Films

Simplicity and convenience should be the keynote of development in pocket camera photography. If roll films are used, no easier or better method can be followed than the use of the Kodak V. P. Tank or other suitable-size tank for the film employed. With the tank, development is a pleasant and cleanly operation, which can be done in any kitchen, bathroom, or other available room at home. The tank gives results, without fuss or muss, and the development powders prepared by the makers of the film in use may be depended upon to do the work better than any individual formula. I have followed this simple method for years, and could not now be persuaded to go back to the labor and uncertainty of the individual development formula.

Filmpack

Similarly, for the development of flat films (filmpack) the use of the Premo filmpack tank is advised. This calls for a dark room and a safe light, which is the only trouble attached to this convenient and practical bit of apparatus.

From an Ansco pocket-camera negative

From an Ansco pocket-camera negative

With the filmpack and a dark room (such as a converted bathroom), those who have the leisure can develop the films in a tray instead of the tank. My method is as follows: Darken the bathroom window with a sheet of opaque cardboard or an opaque spring-roller blind. Fix a board cleated at both ends, about 15 inches wide, across the bath-tub. At the center of the board place the ruby lamp, with an absolutely safe light. Behind the lamp place a deep 10 x 12 tray filled with acid fixing solution. In front of the lamp, and not too close to the light, place another 10 x 12 porcelain tray with deep sides, filled to an inch in depth or less with a reliable developer. In the bath-tub itself, at the right of the lamp, place a good-sized deep tray full of clean water. Now, with everything ready for development, sit comfortably in front of the developing tray, break the filmpack and hold it in the left hand. Strip the first exposed film with the right hand and immerse it in the developer with a free to-and-fro motion until it lies flat and limp in the developer. Repeat this operation with exposed films until you have four or six in the developer. By this time those first immersed will show their images. Examine them and, when the desired density is reached, slide the developed film skilfully into the fixing solution without contaminating the fingers with hypo. Place more exposed films in the developer and proceed as outlined until all are developed and safely in the fixing bath. Wash your fingers under the bath faucet, get out of the room for a little fresh air for a few minutes; return, take the now fixed films from the hypo bath and put them into the tray of fresh water to wash. In very hot weather a little ice in the fixing and washing solutions may be necessary, but the whole operation is so speedy that I rarely find the use of ice necessary.

This is a rough-and-ready way of development, evolved from the necessities of a New York apartment, and a very busy life where the hours count. But it has served me well for years.

Plates

If plates are used, the above method will serve equally well for separate development, with a little more care in handling. But the handling of small plates is apt to become tedious, and I prefer the tank. With some of the tanks in the market a special cage will be needed to accommodate the small plates of the pocket camera, for which the makers have not yet provided. But for some pocket cameras, such as the Ensignette, Goerz V-P Tenax and Ica cameras, proper-sized tanks are already available. Watkins also makes a small tank.

An Expert's Method

Dr. Nathan T. Beers, an expert with the pocket camera, and an enthusiast for the simple life, gives his tank experiences as follows: My tank is made of sheet copper, heavily nickeled. The handle of the basket or plate-rack is pivoted so that it can be swung out of the way when plates are being loaded or unloaded. One of the rivets which fasten the handle of the basket is allowed to project an eighth of an inch, so that it can be hooked over the edge of the tank when the basket is lifted and held suspended to examine the plates during development. If one desires a tank which can be reversed during development, the cover should be made the full height of the tank, and a rubber band put around the plates to hold them in place when the tank is reversed. This tank I had made for use with my Goerz V-P Tenax camera, for glass plates $1\frac{3}{4} \times 2\frac{5}{16}$ inches. It is four inches in height, three inches in width, and two and three-eighths inches from front to back. When properly filled for use, it holds just twelve ounces of developing solution.

If the room in which we have to work contains a wash-basin with running water, so much the better. If not, a supply of water should be provided. Now open and set up the ruby lamp ready for lighting when needed. Fill the tank, which, without the basket, holds exactly sixteen ounces of water, with water (this obviating measures) and empty it into any handy bowl or pitcher. Now dissolve in this the fixing salts—hypo and acid powders. This prepares the fixing bath. Now open a package of Brownie Developing powders. The red package holds the sodas required, and the blue package contains the pyro or developing agent proper. Empty the contents of the red package (sodas) into the tank and cover with warm water about one inch in height, stirring thoroughly until every particle of the soda salts is dissolved. The pyro, contained in the blue package, must not be added until just before we put our plates into the tank, so we lay this package in front of the ruby lamp, where we can readily find it in the dark. Now fill the tank with cold water to within an inch of the top—this gives us just twelve ounces of solution in the tank—and stir it, noting the temperature at the same time. This temperature should be 65°, as indicated on the stirring-rod. A very little experience will tell one how much warm water is needed to dissolve the sodas and give the right temperature for use when the cold water is added.

At this point the room should be darkened, all white light being excluded, and the ruby lamp lighted. Now remove the plates from their holders and slip them, one at a time, into the grooves of the plate-rack or basket. This should be done in the shadow of the body, as the plates are more or less sensitive even to the dull red light of the lantern. Having loaded the basket with exposed plates, we place it in the shadow of the tank for a moment, while we open the blue package of pyro or developing agent and drop the contents into the tank, stirring for a few seconds. Pyro dissolves instantly. The handle of the basket is now raised and the basket and its plates slowly but steadily lowered into the solution in the tank. This done, the basket should be quietly raised a little and lowered once or twice, in order to break up any air-bubbles caused by the first immersion. Now place the cover on the tank and note the time; count ahead twenty minutes and make a note of the time when development will be completed. Extinguish the light and leave the developer to do its work for twenty minutes.

Personally, I have not experienced any necessity for reversing my tank during development, as the construction of the basket keeps the plate fully half an inch from the bottom of the tank, where the solution is apt to become dense. Once or twice during the twenty minutes, however, I give the tank a little shake or movement to stir up the developer. If a reversible tank is employed it is, of course, preferable to reverse it occasionally.

Fixing and Washing

When the time limit of twenty minutes has elapsed, light the lamp, remove the top of the tank and pour away into the sink all the developing solution. Now fill the tank with cold water and pour this away to wash the plates and stop development. The fixing solution is now poured into the tank up to within an inch of the top, completely submerging the developed plates, and the top of the tank covered. All the rest of the work can now be done in daylight. In fifteen minutes the plates will be fixed and cleared of all white or gray deposit. The fixing solution can now be poured off into a bottle for future use, if desired, and the negatives thoroughly washed by placing the basket directly under the tap of running water for half an hour. When washed, the negatives should be taken out of the basket, drained on a piece of blotting-paper, and stood on edge on any convenient shelf or ledge to dry, with a piece of blotting-paper under each negative. Do not attempt to dry small negatives in the rack; my experience proves that, dried in this way, they invariably show drying marks and patches of uneven density.

By this method, the manipulation of a dozen plates is robbed of all the usual tedium and uncertainties, takes a minimum of time and labor, and can be carried through without wetting the hands. The system is simple and can easily be mastered by the beginner; it calls for no expert knowledge or elaborate apparatus; and my experience has shown me that it gives a bigger percentage of clean, good printing negatives than the elaborate hand manipulation I followed in earlier days.

Printing

For the making of prints from the pocket-camera negatives, the reader with experience in photography will doubtless follow his own inclinations. A few hints may be helpful to the new beginner. Because the pocket negatives are so small, the prints they give may, at first glance, look very tiny and somewhat insignificant. But, if the negatives are good negatives, using the word in the technical sense, and if the reader has learned how to place his subjects on the camera finder, and has exercised care and taste in the arrangement of the subject, the selection of the point of view and so on, the little prints will be full of interest and capable of giving much pleasure even in their original small size.

Smooth Papers

It will be obvious that for such small pictures smooth, and sometimes even glossy-surfaced papers will generally be preferred for the rendering of detail and the full range of tone gradations secured in the negative. It is equally obvious that the development papers, such as Velox and Cyko, offer the largest choice of different surfaces and tone effects, and are best adapted to the different qualities of negatives and subjects. There is no need to enter here into any detailed account of the handling of development papers, as this is fully treated in THE PHOTO-MINIATURE No. 93: *Development Printing Papers*, and in the booklets of the manufacturers. But there is no need to confine oneself exclusively to development papers or any other single variety. The self-toning papers, such as Seltona and Aristo Gold, or the printing-out papers, such as Solio, are equally well adapted for our use. The desirable qualities obtainable by printing in platinum and carbon should not be overlooked. There are handbooks to these two latter in THE PHOTO-MINIATURE Series, fully describing their possibilities and manipulation. These two methods are particularly adapted for the making of prints from enlarged negatives. The platinum process gives an artistic or pictorial quality in prints of black or warm black or sepia tones. The carbon process offers a range of as many as thirty or forty different colors, a peculiar advantage of this process.

Masking Prints

If the prints are to be mounted in an album, and every pocket-camera worker should have an album from the very beginning of his work, it will be well to provide a number of opaque paper mats or masks, which are simply pieces of paper with a rectangular aperture, accurately cut with clean edges, about one-sixteenth inch smaller than the print on every side. By carefully adjusting and fixing the little negative to this mask, which should be large enough to cover the piece of printing paper employed, we get a print which when finished has a white margin all about it. For album use or for mounting on several pieces of paper of different tones, by the multiple mounting method, the white margins of the print should be trimmed away so that only a narrow white margin of one-sixteenth or one-eighth inch is left surrounding the picture image. If, on the other hand, a narrow black margin is desired around the print, this can be secured by accurately trimming each negative, squaring the corners carefully, so that all the rabbet is cut off, nothing remaining but that portion of the picture which is desired in the print. Take a printing frame fitted with a piece of clean glass and, laying the negative face to face with the piece of sensitive paper, put the two carefully down upon the glass and close the printing-frame. This will give the picture image surrounded by a dark or black margin which, when trimmed off, so that only a very narrow margin surrounds the picture image, will give the print a desirable, finished appearance. The drawback to this method is that the negatives must sometimes be trimmed down to smaller than their original proportions, in order to get the subject properly squared in the picture. Masking is the better process when this will produce the desired effect. An alternative method, which does not necessitate the trimming of the negatives, is to first mask the negative so that it gives a print with white margins. Now take a sheet of clean glass with a piece of perfectly opaque paper attached to it, in size and proportion to just cover the picture image obtained in the first printing. Adjust this over the print so that the picture image is perfectly covered, and put the print out for a second printing until the white surrounding margins are deeply printed. Trim as already advised for mounting. Other methods of masking negatives to obtain varied tone effects in the margins of the prints are given in THE PHOTO-MINIATURE No. 94: *Photographic Post-Cards*, which is out of print with the pubishers, but may be obtained from some dealers.

For a Slip-in Album

If the album chosen by the reader is one where the prints have to be slipped in under cut-out openings, instead of being mounted, plain prints simply trimmed to the

From an Ansco pocket-camera negative

desired size are all that will be necessary. But this method does not allow any discrimination or selection in the trimming of the print so as to show the subject to the best advantage, and gives an undesirable uniformity to one's print collection. An album of a size convenient for the placing of four prints on a page will be found most convenient, and I should like to say a good word here for the Royal albums as the best and most satisfactory within my knowledge.

Making an Album

A method peculiarly suited to the preservation of prints from pocket-camera negatives is that of making one's own album. This is done by printing the little negatives on paper sufficiently large to bind into book form. Thus, if we take a 4 x 5 or 4 x 6 or 5 x 7 piece of printing paper and adjust the negative so that it is properly placed on the paper, with an even margin at the sides and top and a little larger margin supporting the base of the picture, masking the negative so that the margins are perfectly clean and white, these sheets can afterward be punched at one end and made up into a loose-leaf album which will hold as many prints as we desire. Loose-leaf binders of various sizes and sorts may be obtained from commercial stationers, or possibly from the makers of photograph albums. For the separate mounting of prints, the reader is referred to THE PHOTO-MINIATURE No. 102: *Trimming, Mounting, and Framing*, which gives a variety of methods.

Post Cards

The adaptability of the pocket-camera picture for post-card printing does not need more than a mere mention. Their size and proportions are such as to leave ample room for a word of greeting or brief correspondence. By the use of mats with apertures varying in shape, these little pictures can be given great effectiveness and variety.

Lantern-Slides

The growing popularity of lantern-slide projection also provides an outlet for the pocket-camera picture, by means of which most delightful home entertainments may be given to one's friends, as well during the summer as during the long winter nights. The pocket cameras which give picture 2½ x 3½ inches or 2¼ x 2¼ inches, such as the Icarette, No. 1 F. P. Kodak, Goerz Coat Pocket Tenax, Ansco V. P., Ensignette No. 2 and No. O Ingento, are all adapted for giving negatives from which lantern-slides may be made from simple contact printing. The Victor Animatograph is a splendid little instrument for the projection of slides, whether at home, at the lodge meeting, or in a larger hall, being exceedingly simple in use, and compact and efficient. If the reader possesses the Kodiopticon, or any other lantern-slide projector that has a water-cell cooling device, the new Velox lantern-slide film offers a very simple and convenient method of making slides, simpler than the use of the ordinary glass-slide plate.

Enlarging

Reference was made on an earlier page to the fact that the use of a pocket camera presupposes the use of an enlarger, since the reader will naturally desire to enlarge many of his pocket-camera pictures. About the technical methods of enlarging nothing will be said here, for two reasons. First: the subject is very fully discussed, with instructions covering the making of inexpensive enlarging apparatus, in THE PHOTO-MINIATURE, No. 123: *Enlarging with Gaslight Papers*, wherein Mr. James Thomson has carefully compressed the fruitful experience of some years in this branch of work. And, second, because there are already available five or six enlarging lanterns, with any one of which the making of enlargements on gaslight or bromide papers is quite as simple as the making of prints. The reader who will invest in a Viopticon (the latest of enlargers and aptly described as "the little brother of the pocket camera"), or a Kodiopticon, or Balopticon, or Ingento Enlarging Camera, or the No. O Graphic Enlarger, or the Goerz V. P. Tenax Enlarger; or the smaller outfits, such as the Brownie Enlarger, with its new and convenient Illuminator, or the Ernemann V. P. Enlarger, will be pleasantly surprised to find how very simple it is, nowadays, to produce good enlargements at a nominal expense. There is really no difficulty at all about the process, and the work can be done in the evening as well as by daylight.

Using gaslight papers and a daylight enlarger, the exposure with an average negative will rarely exceed three minutes. Working with gaslight papers and an electric-light enlarger, connected simply to the house wiring, the exposures will average 30 to 40 seconds. These exposures are based on good pocket-camera negatives, which, by the way, should be thin and full of detail, a quality which is readily secured by the aid of the rapid lenses now fitted to pocket cameras and short-time tank development. Gaslight papers are preferable to bromide papers for pocket-camera enlargements, as giving more vigor and snap to the large pictures. The limit of size in the enlargement will, of course, be regulated by the definition in the pocket-camera negative. With the cheaper forms wherein a single lens is employed, the 3½ x 5½ and 5 x 7 sizes will always be available without loss of definition or vigor in the enlargement. If the pocket camera in use is fitted with an anastigmat or aplanat, the definition of the small negative will usually permit of enlarging to 8 x 10 or 10 x 12 and even larger.

With this brief survey of pocket-camera photography, we can now profitably glance over a brief description of some of the cameras of this type available. The list does not contain all the varieties in the market, but will suffice as indicating the characteristics of the principal models.

Vest-Pocket Kodak For pictures 1⅝ x 2½; dimensions, 1 x 2⅜ x 4¾; weight 9 oz.; meniscus achromatic lens, three-inch focus (or on special model, Zeiss Kodak anastigmat, *f* 6.9); ball-bearing shutter, reversible finder. Extremely simple in manipulation; by pulling out the front to its full extent, the camera is in focus for objects at any distance and ready for exposure.

No. 1 Folding Pocket Kodak For pictures 2¼ x 3¼; dimensions, 6¾ x 3½ x 1⅝; weight 16 oz.; meniscus achromatic lens, four-inch focus; automatic shutter; reversible finder. Like the V. P. Kodak this is a fixed-focus camera.

No. 1A F.P.K. For pictures 2½ x 4¼; dimensions, 7¾ x 3⅞ x 1¾; weight 20 ounces; meniscus achromatic lens, five-inch focus, automatic shutter; reversible finder. The size of the picture given by this camera makes it preferable for general purposes to the preceding model. Like No. 1 F. P. K., it is a fixed-focus camera, being focused for objects of any distance as soon as opened.

No. 1A F. P. K. R. R. Type For pictures 2½ x 4¼; dimensions, 8 x 2 x 3¾; weight 23 oz. This model is fitted with a rapid rectilinear lens, speed *f*/8, focal length five inches, ball-bearing shutter, automatic focusing lock and focusing scale.

No. 1A F. P. K. Special This is practically the same camera as the preceding model, but is fitted with a rising and sliding front, rack and pinion for focusing; Zeiss Kodak anastigmat *f*/6.3, or other anastigmats, and Compound shutter.

The Six-Three 1A Kodak This is another new model of the same camera, in which the R. R. lens and ball-bearing shutter are replaced by the Cooke Kodak anastigmat *f*/6.3, and Compound Shutter, highest speed 1/250 second.

No. 1A Speed Kodak For pictures 2½ x 4¼; dimensions, 2¼ x 4½ x 9¾; weight 3 lbs.; rack and pinion for focusing, direct view-finder, choice of four anastigmats; with Graflex focal-plane shutter, speeds from slow inst. to 1/1000 second. Choice of four anastigmat lenses.

2 F. P. Brownie For pictures 2¼ x 3¼; dimensions, 6⅞ x 3⅝ x 2⅛; weight 16 oz.; meniscus lens, four and one-half inch focus, automatic shutter, focusing lock and reversible finder.

2A F. P. Brownie Identical with No. 2 F. P. Brownie, but giving pictures 2½ x 4¼; dimensions, 8½ x 2 x 3⅝; weight 23 oz. (Eastman Kodak Co., Rochester, N. Y.)

1A Graflex For pictures 2½ x 4¼; dimensions, 5½ x 9½ x 3; weight 4 lbs.; focal capacity six and one-half inches; fitted with the Graflex focal-plane shutter, giving exposures from Time to 1/1000 of a second; fixed apertures. Choice of three anastigmats. This camera is for roll films, and offers all the advantages of the reflecting mirror type with special features covering simplicity and efficiency of operation.

The No. 0 Graphic For pictures 1⅝ x 2½; roll films; dimensions, 5 x 3½ x 3¼; weight 25 oz.; fitted with anastigmat *f* 6.3; focal length three inches; and auto Graflex focal-plane shutter, giving a range of exposures from time to 1/500 second; with a folding sight-finder. (Folmer & Schwing Division, Rochester, N. Y.)

Premoette Jr. Nos. 1 and 1A No. 1 for pictures 2¼ x 3¼; dimensions, 1⅜ x 3¼ x 4⅝; weight, 11 oz.; meniscus lens; Kodak ball-bearing shutter, direct view-finder. No. 1A for pictures 2½ x 4¼; dimensions, 1¾ x 3¼ x 5¾; weight 18 oz.; meniscus lens; kodak ball-bearing shutter with finger release only; brilliant reversible, collapsible finder. These models may also be obtained with Planatograph lens, or in improved form, with Zeiss Kodak anastigmat, *f* 6.3 and Compound shutter, under the name Premoette Jr. Specials Nos. 1 and 1A.

The Six-Three Premoette Jr. No. 1A This is another new model, fitted with a Cooke Kodak anastigmat *f* 6.3, and Compound shutter. All these models are intended for use with the film-pack. (Rochester Optical Division, Rochester, N. Y.)

Ansco Vest-Pocket For pictures 2¼ x 3¼; fits the waistcoat pocket. A fixed-focus camera, giving every object from eight feet distance in sharp focus when simply opened. For roll films, six exposures.

No. 1 Folding Buster Brown For pictures 2¼ x 3¼; dimensions, 1¾ x 3½ x 6¾; weight 16 oz.; meniscus lens; self-setting shutter; brilliant reversible finder. This is a fixed-focus model, being ready for action as soon as opened. For use with roll film.

No. 2A Folding Buster Brown For pictures 2½ x 4¼; dimensions, 2 x 4 x 8½; weight 21 oz.; special meniscus lens; brilliant reversible finder and automatic focusing lock. For roll films, six or twelve exposures.

Ansco Jr. For pictures, 2¼ x 4¼; dimensions, 2 x 4 x 8½; weight 25 oz.; rapid symmetrical lens U. S. 4; automatic shutter; brilliant reversible finder. This camera is also obtainable with an anastigmat *f*/6.3 and Ansco shutter. For six or twelve roll-film exposures.

No. 1A F. P. Ansco This is a new model for pictures 2½ x 4¼; dimensions, 1¾ x 3⅞ x 8⅛; weight, 29 oz.; rapid symmetrical lens; Ansco automatic shutter. Special automatic plano reversible finder. Automatic focusing scale. (Ansco Company, Binghamton, N. Y.)

Ensignette A vest-pocket camera, for pictures 1½ x 2¼; dimensions, 1⅞ x 3⅞ x ¾; meniscus lens, *f*/11; automatic shutter and brilliant finder. For six-exposure roll films.

The Ensignette Special is a focusing model so constructed that anastigmats may be used with it, giving pictures of finer definition than is possible with the meniscus lens of the Ensignette. It is obtainable with choice of four anastigmats.

Ensignette No. 2. Very similar to the Ensignette, but giving pictures 2 x 3; dimensions, 2⅜ x 5 x ¾.

Ensignette Jr. For pictures 2¼ x 3¼; dimensions, 7¼ x 3½ x 1¼. This is a fixed-focus model, with meniscus lens *f*/11, and everset time and instantaneous shutter.

Folding Ensignette Jr. This camera is made in two models, for pictures 2¼ x 3¼ (dimensions, 3 x 7 x 1½) and for pictures 2½ x 4¼ (dimensions, 4 x 8 x 2). They have choice of meniscus or rapid symmetrical lens, with T.I.B. shutters; focusing scale and infinity catch and brilliant reversible finders. For roll films.

Ensign Reflex For pictures 2½ x 3½; dimensions, 5¾ x 6¼ x 5; weight, 50 ounces. This camera is sold with or without a lens. It has rack and pinion focusing, reversing focusing hood, rising and setting automatically; rising and falling front, the displacement being shown on the mirror; revolving back, and focal-plane shutter, giving exposures to 1/1000 second. A sky shade is hinged on front panel. The mirror is everset and perfectly balanced. This model is also obtainable in 3¼ x 4¼ size. (American Agent, G. Gennert, New York.)

Goerz Vest-pocket Tenax

For plates or filmpack; pictures 1¾ x 2$\frac{5}{16}$; dimensions, ¾ x 2¾ x 3½; weight, 13 ounces. Constructed of metal, collapsible-box form, with leather bellows. Can be used as a fixed-focus camera if desired, but has a recessed focusing device with direct-vision finder, fitted with Goerz Dagor, Celor or Syntor lens, 3 inches focus, and Compound shutter with speeds up to 1/250 second.

Goerz Coat-pocket Tenax

For pictures 2½ x 3½; dimensions, 1⅛ x 3¾ x 5½. In construction this model closely resembles the Vest-pocket Tenax. (C. P. Goerz American Optical Co., New York.)

Ica Miniature Cameras

For pictures 1⅝ x 2½; plates or filmpack. These are German-made cameras, having exceptionally large and brilliant finders, ground-glass focusing back and tripod sockets. They are noted for their fine workmanship, precision of movement, and are fitted with anastigmat lenses.

Victrix No. 48. A compact folding model with rapid aplanat lens, *f*/8: automatic shutter, speeds 1/25, 1/50, 1/100 second; also bulb and time adjustments.

Atom No. 51. A miniature camera fitted with aplanat lens at *f*/8 or *f*/6.8 and automatic shutter, or with anastigmats and Compound shutter. On opening the camera, the lens automatically locks focused for infinity, but it also has a focusing attachment operated by a lever for adjustment for different distances.

Atom No. 53. This camera is similar to Atom No. 51, except that it opens horizontally instead of vertically, and is fitted with a shorter focus lens, thus embracing a greater view angle and giving better definition. Equipped with choice of two anastigmats at *f*/6.8 or *f*/4.5, and Compound shutter.

Bebe No. 40. This model is of a distinctive type, strongly built in collapsible-box form. When extended, the front locks focused for infinity. For closer distances, focusing is done with a lever adjustment. It has choice of two anastigmats at *f*/6.8 or *f*/4.5, and a simple shutter, with speeds from 1 to 1/100 second.

Ica Pocket Cameras For pictures 2½ x 3½. Four models. Very compact and rigid, with large, brilliant collapsible finders.

Cupido No. 75 is constructed of metal, leather covered, has hooded ground-glass focusing back, rising and falling front, focusing lever, two tripod sockets, spirit-level, and reversible finder. On opening, the front locks automatically focused for infinity. Fitted with Helios lens *f*/8 and automatic shutter, speeds 1 to 1/100 seconds, or choice of two anastigmats at *f*/6.8 or *f*/4.5; automatic or Compound shutter.

Ideal No. 111. This camera is in many respects like the Cupido, but has a long bellows extension, and may be used for telephoto work by removing the front lens and working with rear lens alone; rising and falling front; fitted with choice of four anastigmats at *f*/6.8 and *f*/6.3; and automatic or Compound shutter.

Niklas No. 109. Very similar to the above, but more compact and lighter in weight. The bellows extension will not permit the use of the single element of a convertible lens. A moderate-priced camera.

Bebe No. 41. Very similar in construction to Bebe No. 40, constructed of metal, leather-covered, with brilliant, direct finder, and shutter with speeds from 1 to 1/200 of a second. Choice of two anastigmats at *f*/6.8 or *f*/4.5. (International Photo Sales Co., New York.)

No. 0 Ingento A rollfilm pocket camera, for pictures 2¼ x 3¼; dimensions, 1¼ x 3 x 6¼. Constructed of metal, leather-covered; automatically focused for objects at all distances when opened, meniscus lens U. S. 8 (*f*/16). Other models with R. R. and anastigmat lenses; automatic shutter for time, bulb and instantaneous exposures. Brilliant, reversible finder, and tripod sockets. For details of 1A Ingento, just introduced, see later page. (Burke & James, Inc., Chicago, Ill.)

Polygon Vest-Pocket This is a German-made camera; double extension by rack and pinion; detachable lensboard, with vertical and lateral movements; reversible, brilliant finder, focusing hood with ground-glass, the latter removable for autochrome work, infinity catch and scale for rear lens. Made in three pocket sizes: for pictures 1¾ x 2⅜; size of camera, 3½ x 2½ x 1⅜; weight, 12 oz.; fitted with choice of four anastigmats working at *f* 6.8, *f* 6.3, *f* 5.5, *f* 4.5, with focal lengths varying from 2⅜ to 3¾; compound shutter for exposures up to 1/300 second; for plates or filmpacks.

Polygon Pocket Size For pictures 2½ x 3½. Size of camera, 4¼ x 3¼ x 1⅜; weight, 16 oz. In all other details similar to the Polygon Vest-Pocket. A telephoto lens *f* 2, available for the above two cameras, permits magnifications with complete lens up to 8x (with the rear lens up to 16x). This telephoto lens is instantly attachable to the camera lensboard.

Ernemann Reflex This is of square construction, with revolving back for vertical and horizontal pictures; for pictures 3½ x 2½ and 3½ x 3½; dimensions, 5⅛ x 6⅛ x 6¼; extension, 6 to 8¾; weight, 70 oz. Choice of three anastigmats at *f* 4.5.; focal-plane shutter for exposures up to 1/2500 second. Also obtainable in 3¼ x 4¼ size.

Ernemann Bob 15 A rollfilm camera, with automatic spring-out front, bringing the lens at once to the infinity point; for pictures 1½ x 2½; size of camera, 1⅛ x 3 x 6; weight, 16 oz.; reversible finder; focusing lever and scale from infinity to five feet; choice of five anastigmats.

Ernemann Baby Camera A waistcoat pocket camera for plates, 1¾ x $2\frac{5}{16}$; dimensions, 1 x 2⅝ x 3⅝; weight 8 oz.; focusing screen with light hood; achromatic lens, with shutter for time and intantaneous exposures; Newton finder. A filmpack adapter is available.

Ernemann Heag XIV For pictures 1¾ x $2\frac{5}{16}$; dimensions, 1 x 2½ x 3½; weight, 10 oz.; choice of seven anastigmats and three different shutters for exposures from 1/25 to 1/300 second. Plates or filmpack.

Ernemann Heag XV A miniature camera for pictures 1¾ x $2\frac{5}{16}$ and 3½ x 2½; automatic self-erecting front, reversible finder, focusing screen with light hood, automatic shutter giving time, bulb, and three instantaneous exposures up to 1/100 second. The two models measure 1 x 2½ x 3½ inches and 1⅛ x 3⅛ x 4½ inches, and weigh 10 oz. and 16 oz. respectively. Choice of seven anastigmats. The 3½ x 2½ camera has rising and falling front and reversible hood for autochrome work.

Ernemann Klapp Camera For pictures 3½ x 2½; dimensions, 1¼ x 4¼ x 5¼; weight, 26 oz. A collapsible, extremely compact model, with leather bellows, folding finder, lens in focusing mount, and focal-plane shutter for exposures up to 1/2500 second. (American Agent, Max Meyer, New York.)

Expo Watch Camera This is a metal camera, closely resembling a silver watch in size and shape; weight 3 oz. Carries daylight-loading film for twenty-five pictures, ⅝ x ⅞ inch, and has time and instantaneous shutter.

Expo Police Camera A roll-film camera, for pictures 1 x 1⅝; dimensions, 2½ x 3⅜ x 1. Fixed focus achromatic lens, *f*/16; and focal plane shutter. (Expo Camera Co., New York.)

Notes and Comment

Max Meyer, 18 West 27th Street, New York, has just published a very complete illustrated catalogue of the Ernemann cameras, made in Dresden, Germany, Those who would like to see how wonderfully one German manufacturer has developed the hand and pocket camera will do well to get a copy of this catalogue. Mention THE PHOTO-MINIATURE when writing.

We are advised by W. J. Lafbury Company, 305 North Fifth Avenue, Chicago, that they have taken over from Kreps & Stelling the American agency for the Rodenstock photographic lenses, so that orders for these well-known German lenses and other business communications should hereafter be addressed to the Lafbury Company. Mr. W. J. Lafbury, the president of the company, acted for some years as the western representative of Kreps & Stelling, so that he is well acquainted with the trade and customers of the concern.

The Eurynars are double anastigmats, made at the famous optical works of Rodenstock, at Munich. They are lenses of the symmetrical type, made up of four uncemented glasses, the front and rear combinations being identical. Either combination may be used separately as a thoroughly corrected anastigmat of twice the focal length of the complete objective. This use of the Eurynar gives soft pictorial effects and, of course, larger images by reason of the greater focal length of the single combination. Because of the simple construction, each element being composed of two thin uncemented glasses separated by a small air-space, there is no loss of light by absorption in the use of the Eurynar. The three Series I. f/6.8; III. f/5.4; and IV. f/4.5, cover every sort of work where the finest optical correction and extreme rapidity are desirable. The Series I lens (No. 2, 6½ inches focus) is supplied in cells to fit the Eastman ball-bearing shutter, as supplied with the 3A Kodak and 4 x 5 cameras, at $21. In this form the Eurynar brings within the reach of every amateur a modern anastigmat of the highest type and all its possibilites, at a very reasonable figure. We suggest that our readers make themselves acquainted with the Eurynar.

Messrs. Burke & James, Inc., Chicago, advise that they now have ready a No. IA Folding Ingento camera, following the No. O Ingento introduced a few weeks ago. The IA camera gives pictures 2½ x 4¼ inches, the most popular of amateur sizes. The dimensions of the camera are 1¾ x 3 13/16 x 8⅜, which practically makes the instrument a coat-pocket camera. The lens equipment includes a 5-in. R. R. lens, speed U. S. 4 (*f* 8). The camera may also be had fitted with a universal focus, achromatic meniscus, which gives all objects beyond 8 feet away in sharp focus. The shutter is an Ilex Automatic, and the finder is of the hooded, brilliant, reversible and dust-proof type. If desired, the camera may be equipped with the Voigtlander Dynar lens, *f* 6, and No. O Compound shutter. The prices for the camera so equipped are respectively: with the R. R. lens, $15; with the meniscus, $13.50; and with the Dynar, $45.

For an hour's absorbing reading about lenses, cameras and optical accessories, with half-a-hundred beautiful illustrations, the reader is advised to send to the C. P. Goerz American Optical Co., 317 East 34th Street, New York, for a copy of the new Goerz catalogue. In the first sixteen pages is given a practical handbook to "The Optics of Lenses," with some very useful tables of depth of field and angle of view. This section is followed by descriptive illustrated lists of the various Goerz anastigmats, prisms, telephoto lenses, shutters, cameras, binoculars, and optical sundries. The catalogue is a credit to its maker as well as to the house publishing it.

The new 1913-1914 illustrated list of Cooke lenses and Cylex lenses offers several new introductions about which my readers should be informed. Among these is the series 3A Cooke, for use with Kodaks, Century, Premo, Seneca, and Hawkeye cameras, having a full aperture of *f*/6.5, and giving the microscopical sharp-picture images for which the Cooke lens is famous. Considering the quality of its performance, this anastigmat is most reasonable in price. Another interesting item is the Cooke Telar. A compact high-speed lens of long foçus, requiring only a short bellows extension, working at *f*/7, and giving an image approximately twice as large as that given by the normal hand-camera lens. The No. 1 Cooke Telar has focal length of 8 inches, and can be fitted to a camera with an extension of only 4½ inches, which makes this objective available for many of the pocket cameras now so popular. New series of Cylex double and convertible anastigmats are also listed in this catalogue.

The Viopticon is not only a wonderful little enlarger for the pocket-camera negative, but it also serves as a projector for lantern-slides, made from pocket-camera or other negatives, giving any size image at any distance. It is a wonderful little instrument and deserves its popularity. But the point I wanted to make is that the Victor Animatograph Co. are working a revolution in the matter of lantern-slides and lantern work. As one step in this revolution, the popularizing of the projecting lantern, they are offering a very large selection of lantern-slides, for use in any lantern, at 10 cents each plain, or 20 cents each colored. This is remarkable, since the standard prices for lantern-slides, since time immemorial, have been 50 cents plain and $1 colored. How the Victor people do it is beyond me; but the slides are excellent in quality, both plain and colored.

Some days ago, in looking through the album of a friend, I came across a dozen flower studies, wild flowers photographed in their native haunts, which delighted me by their exquisite detail and modeling. Answering my request for details as to his method of securing such desirable results, my friend said: "There is no method, I simply use the Kodak Portrait Attachment on my Kodak, and anyone can make these things if he will simply fit the K. P. A. on to the lens of his Kodak." The Eastman Kodak Company have a booklet which tells about the use of this little attachment, and every reader who has a Kodak should see this little book.

The tempting catalogue of the Ensign and Ensignette cameras comes to my table from G. Gennert, who, I note, now has stores in Chicago and San Francisco, as well as New York. The variety of pocket and hand cameras in the Ensign catalogue is surprisingly large, embracing vest-pocket, folding, box, and focal-plane cameras, with a comprehensive list of photographic specialties for the hand-camerist. The cameras include the popular Ensignette, Ensignette Special, Ensignette No. 2, and Ensignette Junior, which are described elsewhere in this issue; also several new models of the Folding Ensign, for pictures from 2½ x 4¼ to 3½ x 5½; the Imp camera, the Atom V. P., Sylvar and Sylvex, and the Ensign Folding and Box Reflex camera. It is a veritable feast for the man in search of the perfect camera, and the reader will enjoy looking through its well illustrated pages. Copies may be obtained from any of the Gennert stores, as above, free of charge.

The new Ansco Catalogue for 1913 has many new features, in addition to the well-known Ansco line. Chief among these is the 1A Folding Pocket Ansco, which is the first of a new line of aluminum-body, round-cornered cameras, with distinctive features not possessed by other cameras of this type. For example, the spool film and winding key are drawn out and held out automatically until the camera is loaded, then pushed back into place. This obviates the necessity for using both hands when inserting the film. Another novelty is a spring spoon which always keeps the black paper taut in holding the spool, thus making it impossible to fog the film by the roll unwinding while loading, and also serves to automatically lift out the roll from the camera after exposure, without having to pry it out, as often happens with other film cameras. Another vital improvement is the automatic Plano reversible finder fitted to these new cameras. This finder, by the mere act of reversing, also reverses the position of the mirror, so that, when the camera is held horizontally, the finder is in position for a horizontal view; and when vertically, it is in position for a vertical view. This obviates the danger of leaving out of the picture something which may be important in its composition.

The Ansco V. P. is another 1913 model. The size of the picture is 2¼ x 3¼, which is not so small as that given by some other V. P. cameras, and the lens is so corrected that the pictures it gives can be enlarged up to 8 x 10 and even 10 x 12 in., without noticeable loss of sharpness. The Ansco V. P. is very simply brought into action by a single draw, when it clamps ready to photograph any object more than 8 feet away without focusing.

As the camera becomes more and more an instrument of precision and automatic operation, the worker is being left more and more free to give his attention to the pictorial make-up or composition of his work. For those who aspire to better things than picture-making, I heartily commend Mr. Dow's "Composition," recently published. This book not only teaches the appreciation of the beautiful forms by simple principles, which the reader can apply in his work with the camera, but it is a remarkably clever piece of book-making, and a delight to the eye as well as to the mind.

Books and Prints

All books noticed in these pages may be obtained from the publishers of THE PHOTO-MINIATURE, and will be promptly forwarded, postpaid, to any address on receipt of the publishers' prices as here quoted.

Telephotography by Cyril Lan-Davis, F.R.P.S. 130 pages, with 16 plates and 7 diagrams. Cloth, 75 cents. This is a helpful handbook for the beginner in telephotography, written by one whose intimate familiarity with telephotography equips him to deal with the subject in a thoroughly practical way. Clearly and yet fully Mr. Lan-Davis tells the reader what is meant by the scale of a picture; the use of positive and negative lenses: the advantages of telephoto lenses for obtaining photographs of distant objects; their advantages when used for photographing near objects (a branch of the subject which has been largely overlooked by previous writers of the subject); some commercial telephoto lenses—variable and fixed types; exposure; depth of focus; telephoto perspective; simple measures and calculations, with rules and tables for the telephotographer. The numerous plates and diagrams interspersed in the text, together with the working data, make this a very useful handbook for those who want to have a better appreciation of the significance and usefulness of the telephoto lens.

The Romantic Story of the Puritan Fathers: And Their Founding of New Boston and the Massachusetts Bay Colony, Together with Some Account of the Conditions which Led to Their Departure from old Boston and the Neighboring Towns of England. By Albert C. Addison. 242 pages; profusely illustrated. Boston. L. C. Page & Co.

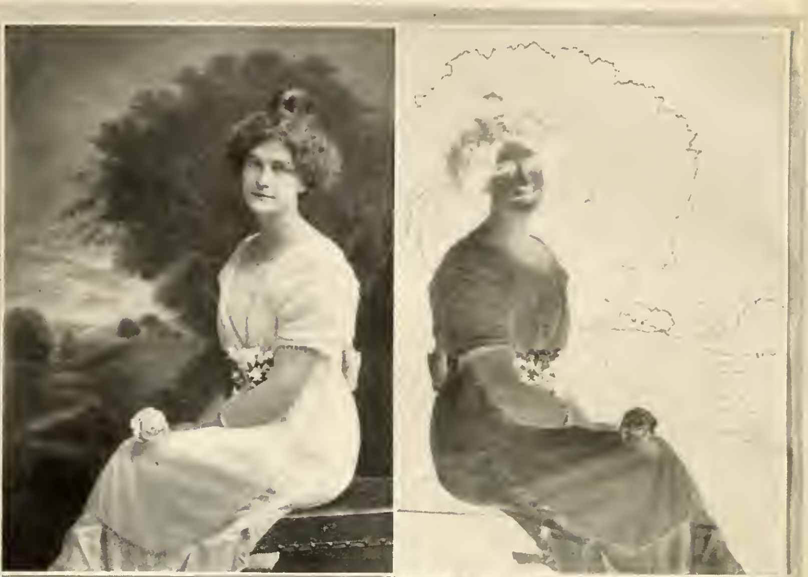
This is one of those beautiful volumes, with fair text printed on decorated pages, illustrations handled in the very finest method, and attractively bound with a gold cover design, which the booklover handles with keen pleasure, or perhaps sends to an appreciative friend.

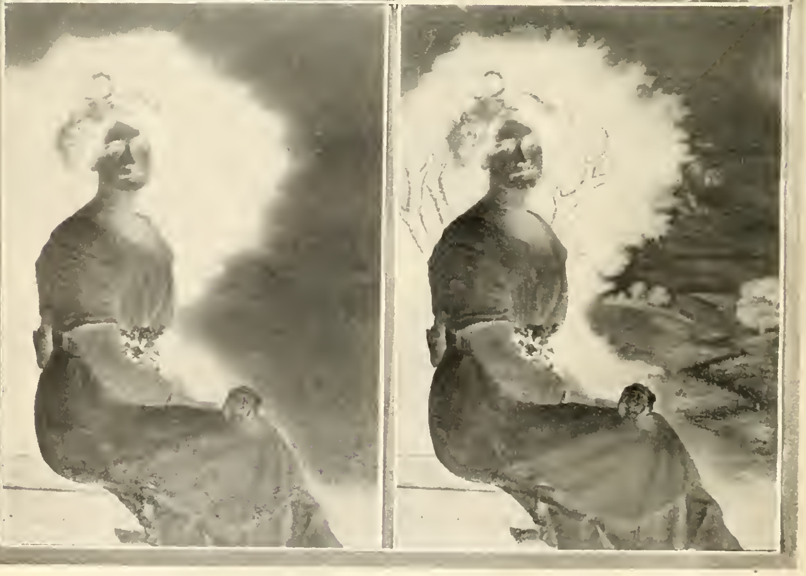
Apart from the beauty of the volume itself, the story, as indicated by the title, is one of the most fascinating bits of human history imaginable. The author takes us back to old Boston among the Fens of England, and tells us most interestingly of the Puritan Exodus around 1630, when John Cotton himself delivered the farewell sermon on the deck of the Arbella. The beginnings of the Massachusetts Bay Colony and the founding of Boston, Mass., are told in chapters and pictures which hold one's attention closely. The reading seems like the turning over of the pages of an old history, and one's heart moves in warm sympathy with, and admiration for, the splendid men and women who played so great a part in the early days of New England. We commend it to all lovers of our country, and especially to the new generation coming on.

Old Paris: Its Social, Historical and Literary Associations. By Henry C. Shelley. 354 pages; profusely illustrated; cloth, designed cover, gilt top. Boston. L. C. Page & Co.

This is a traveler's book, giving an account of the famous cabarets, hotels, cafés, salons, clubs, pleasure-gardens, fairs and fêtes, and theaters of the French capital in bygone times. Those who know the Paris of today will enjoy this book, with its wealth of illustrations, recalling all sorts of memories, of things seen and of things read of in books. Mr. Shelley is already known as a capital story-teller by his "Inns and Taverns of Old London" and "The British Museum: Its History and Treasures." His new volume covers a field which has not been overwritten, and hence has plenty of new interest to the reader of today. The illustrations are gathered from all sorts of rare sources. and enhance the story.

FIGS. 1 and 2 (this last showing negative with plain ground).





FIGS. 3 and 4, showing the second and third stages of working the design into the plain ground negative.

The Photo-Miniature
A Magazine of Photographic Information
EDITED BY JOHN A. TENNANT
Volume XI MAY, 1913 Number 126

Putting Backgrounds Into Portrait Negatives. Shaded Vignettes on White Grounds. The Use of Etching-Knives. Repairing Broken Negatives

Ever since the beginnings of portraiture, the background question has perplexed the photographer—professional and amateur. Which is proof sufficient that, though likeness and the pleasing arrangement and lighting of the subject are the vital elements in successful portraiture, the background is a detail of prime importance. That it can make or mar the total effect of a portrait is an elementary fact; but an elementary fact which is all too generally overlooked or neglected by photographers. The old masters in painting were scrupulously careful in this matter, and their works are still the most profitable source of inspiration for the portrait photographer. Especially would I urge the study of the portraits by Raeburn, Romney, Gainsborough, Lawrence and Reynolds upon those who seek guidance and suggestion in this detail of backgrounds. Take, for example, Lawrence's portrait of Lady Blessington, or Raeburn's portrait of Mrs. Campbell of Balliemore. Half an hour's study of these should surely persuade the intelligent portraitist to shun, forever, the hard and meaningless plain ground of one even tone, and the stereotyped anachronisms offered by the commercial background manufacturer.

The best word I have found on this question of backgrounds in portraiture (and I have sought diligently through volumes and volumes of photographic journals) is given in the last three or four lines of Sadakichi Hartman's "Drapery and Accessories," THE PHOTO-MINIATURE No. 109. I quote them here: The right background is one which suggests spontaneity and naturalness; which unconsciously envelopes and harmonizes with the figure, claiming no more attention than we care to give it apart from the figure or chief motif of the picture. This sums up the background question from A to Z, but its application in every-day practice is attended with peculiar difficulties.

Repetition Undesirable

Every subject, every figure or group, demands its own background. Never have I known a portrait painter to repeat the same background in his portraits of different subjects. Always there is variation in the design, or in the placing of the light and dark spaces behind the subject. So should it be in photographic portraiture. And yet, if we go through a hundred portraits by the average professional photographer, whether on Fifth Avenue or the Bowery in New York, or London, or Keokuk, Iowa, we find the same background repeated again and again, with subjects which are as much alike and as widely different as "the Colonel's lady and Judy O'Grady," of whom Kipling wrote.

Why Photographers Repeat

The reason, or excuse, for this monotonous repetition of backgrounds in photographic portraiture is not far to seek. The painter, working with brush and colors on his canvas, can vary his backgrounds without any difficulty at all, simply drawing upon any scene or arrangement remembered, or from his sketchbook or imagination, according to the needs of his subject. But the photographer must have, or thinks he must have, a real and actual background in place behind his subject when photographed. It is a mistaken notion, as we shall see, but it exists, and is the source of the background difficulty which, as I said, has perplexed photographers since the beginnings of portraiture. As a general thing, people want backgrounds, with design and variety, in their portraits, such as they are accustomed to see in paintings, and the photographic portraitist must meet this general desire. Now a painted ground, simulating the effects seen in the works of portrait painters, is necessarily expensive, costing from $18 to $50, so that few studios can afford to carry more than a dozen of them. Of necessity they must be used again and again, and the same design is made up in quantities and sold to many photographers. Hence the monotony and repetition complained of above, which is so common that it is regarded by many photographers as a necessary evil.

Efforts to Avoid Repetition

Because of this practical impossibility (as it is considered) of providing a sufficient variation in grounds for their subjects, and also because of the unspeakable atrocities offered by commercial background painters, portraitists of the better sort have given endless thought and labor to the solution of this background difficulty. In the early days they used the pillar and curtain device, with a plain ground, to get variety of effect. Later, elaborately constructed wooden and papier-mache reproductions of medieval or palatial doorways, walls, stairways and windows were introduced, and in turn discarded. Others, again, have run the gamut of possible changes with designed textiles and fabrics, such as burlaps, velvets, tapestries and the like. When the amateur "pictorialist" came into professional portraiture with his "high-toned painter notions," he (or she) employed plain grounds exclusively, or the studio interior itself, as a protest against the intolerable commercial ground. Many professionals followed this novelty for a while until the monotony of the plain, unrelieved ground became apparent, and the idea was abandoned. Latterly, a lattice window has been exploited as the proper thing for artistic effects, and the photographers' display-cases are full of this cross-barred abomination.

Their Failure

All these attempts to get away from the conventionalized products of the professional portrait painter have proved unsatisfactory. They cannot, in fact, solve the question, and are not worth the labor and expense they involve. The public demands the designed ground, or one with variety of light and shade in it, to set off and relieve the figure. For which reason, however unwillingly, many photographers are returning to the use of commercial backgrounds, the making and selling of which is an increasingly profitable business for a small group of manufacturers.

Based on Error

It is, as I said, a mistaken idea, this dependence of the photographer upon the commercial background painter. There is no reason why the photographer should not make his own backgrounds, just as the painter does, giving each subject its own individual and appropriate setting. Not that by this revolutionary suggestion I mean that photographers should paint for every sitter a ground of the conventional sort and size, using a sheet of muslin eight by sixteen feet and pounds of distemper of several shades of color. Heaven forbid! The methods herein described refer to backgrounds of the same size as the negative with which they are to be used, made in a few minutes, with the simplest materials and practically without expense.

Advantages of Individual Backgrounds

These methods of putting individual backgrounds into portrait negatives mean a great deal to the photographer who will master the simple technique they require. They are being used here and abroad by many prominent photographers who, however, have jealously kept the secret to themselves. They are as simple to make as they are practical in use, requiring only a little taste and skill, with practice to give facility in their production.

The idea is a money-saver and offers a practical economy, especially for the photographer starting with a small capital. At the same time, the busy and prosperous portraitist in the large city will find the idea just as valuable to him as it is to the man in the small town.

It offers the photographer almost complete freedom from the commercial background painter, enabling him to produce for himself an unlimited variety of grounds at practically no expense. It also clears the studio of all the litter and dust, and labor and weariness, involved in storing and handling the usual assortment of grounds carried under the skylight. It gives the photographer the power to make every portrait different from every other, and to completely differentiate his work from that of his competitors.

These are very definite advantages, and are surely worth a little trouble in the beginning. The methods of etching negatives and positives, copying a head from a group, and repairing a broken negative are equally valuable, and, like the preceding methods, are here published for the first time. I am glad to be able to give the methods in detail, with illustrations, in THE PHOTO-MINIATURE. They embody the practical experience of a worker trained in the technical schools of Germany, where manipulative photography is taught with a thoroughness unknown on this side, and will, I believe, prove to be a very valuable addition to the scanty literature of the subject. EDITOR.

Materials Required

For the production of these home-made backgrounds, all that is needed is a plain black ground and a white ground; a supply of ground-glass substitute (or fine matt varnish), or matt celluloid in sheets; some crayon sauce or pastel colors, or the lead from a pencil rubbed on a piece of cardboard; a stomp or two, and a good, wedge-pointed rubber eraser. Most of these things are kept in the average studio, being constantly used by retouchers and print finishers.

Simplicity of the work

No great or special skill is necessary to produce pleasing results, but good taste is essential and an eye for pictorial effects. The suggestions needed for designs are everywhere accessible in paintings or reproductions, engravings and similar sources. In the examples which illustrate the methods here given I have purposely chosen conventionalized designs, with which most photographers are familiar. In many of them the effects to be sought for are exaggerated to allow for a certain loss in reproduction. When, by practice, the reader has secured the skill necessary for the work as here outlined, he will readily acquire the feeling and facility needed for the production of the more subtle and refined effects of light and shade, such as we see at our conventions in the portraits by Hoyt, Garo, Pierce, Strauss and other well-known workers whose portraits are stamped with their individuality. Those who are familiar with the air-brush and its use can readily secure with that instrument all the results here described. I have confined my instructions to hand-work, since so few photographers possess an air-brush or can use it successfully. Finally, although the methods given are published for professional workers, it will be obvious that they are equally suited for application in home portraiture by amateurs. As a matter of fact, they are most largely used by those professionals who, like Pierce, specialize in making portraits of their patrons in their own homes.

DESIGNS PUT IN ON A DARK GROUND

Of the several methods used in putting individual backgrounds into portrait negatives made, in the first instance, with plain grounds, two methods are most generally employed. In the first, the glass side of the negative is coated with ground-glass substitute, and the background desired is worked thereon. In the second method, a sheet of matt celluloid is placed in contact with the negative, and the background design is worked upon the celluloid, just as instructed for the first method. Each method has its advantages and disadvantages. The ground-glass substitute covered negative, once prepared, is always ready for printing in case of a reorder. But it is easily scratched and needs care in handling. Every scratch shows. The celluloid negative is less liable to injury, and one may use the design it bears with other negatives of similar subjects, with a little change here and there to adapt it to the new subject. But in the case of a re-order, one may have forgotten which ground was used for the first order, or the proper ground may be mislaid or lost because separate.

The manipulation employed is practically alike for both methods, and we will use the ground-glass substitute coated negative to work on in describing and explaining the process. Of course, it is understood that for this method this negative is one originally made with a plain black ground.

Preparing the Negative

As some photographers are not familiar with the coating of a plate with ground-glass substitute, and a perfect working surface is essential to the best results, we will first show how this is to be done.

First, clean the glass side of the negative thoroughly. Be sure there are no spots of any kind left. Now, in a place where there is neither dust nor a strong draught, take your negative with your left hand by the lower left-hand corner and, holding it level, pour enough varnish in the middle to cover the plate. Tilt the plate so that the varnish flows first to the upper right-hand corner, let it follow the top toward the upper left corner, down the left side until it reaches the corner, and from there to the lower right corner, from which the surplus is poured back into the bottle. While doing the latter, rock the plate from side to side, to prevent the varnish forming streaks. A little practice on some waste plates will soon teach you how much to pour on and how to tilt the plate properly. Don't get nervous and let the varnish run over the edges on the film side. Should this occur, moisten a wad of absorbent cotton with alcohol and rub it off. There is little danger of the varnish running over if you tilt the plate slowly, and avoid jerky motions.

In case the coating should have been done badly and you wish to remove it, proceed as follows: First, soften the varnish by pouring some alcohol on it, and with a knife scratch all over it to break it up. Rub over it with a rag or soft paper, then, to complete it, use water instead of the alcohol, and it will come off quite easily.

After the plate is coated successfully and thoroughly dry and hard, it is put on a retouching stand, film down. This stand must have an opening large enough to show the whole picture, as the general effect of our drawing can best be judged that way. Any arrangement which will support the negative on an inclined plane, with a white card beneath to reflect light through the negative, will answer

Starting with a Simple Design

We will start with one of the easiest designs, shown in Fig. 1, a so-called Reynolds ground. See frontispiece.

Take a very soft pencil (Hardtmuth's Koh-i-noor 6 B. being best) and very faintly outline the design as in Fig. 2. Now take a chamois stomp charged with graphite from a lead pencil (you can use the lead left on the emery paper from sharpening your retouching pencil), and rub it over the part of the picture which you wish to change into a scene. Use horizontal strokes over the part where the sky is to be, as it will produce cloud effects more easily. Go over your pencil outline without fear, for you can take off the lead-coating quite easily with the rubber; in fact, it will make a better outline later if you do so.

Charge your stomp well with lead and put on as much as the varnish will take. This will give the effect shown in Fig. 3. After this coating is complete, take a sharp piece of rubber and rub out the trees, the smaller ones in the distance and the outline of the large one behind the subject. Next take the stomp and put detail in the nearest large tree, little dabs for foliage, and a few lines to indicate trunk and branches of the tree.

With the soft pencil darken the sky, commencing at the horizon with the heaviest strokes and gradually lighter toward the top. Use horizontal strokes and imitate clouds. Below the horizon draw a kind of zig-zag band, imitating a road, not so heavy as the sky, but to appear somewhat lighter in the picture than the surrounding landscape. Make it narrowest near the horizon, and gradually widen it as it comes nearer the foreground to give distance to the scene. This should complete the design as shown in Fig. 4. If carefully done, the print from the negative will reproduce the effect seen in Fig. 1.

FIG. 7.

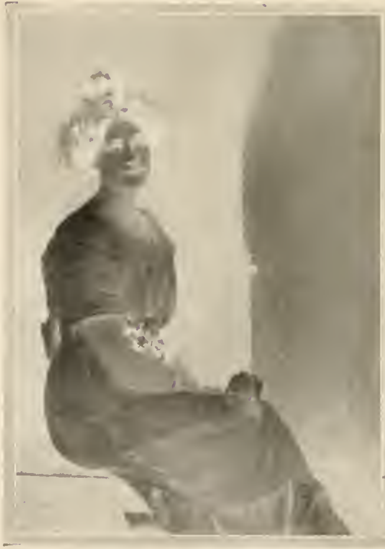


FIG. 8

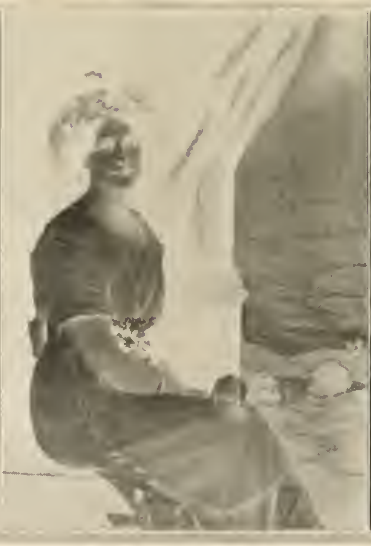


FIG. 5.

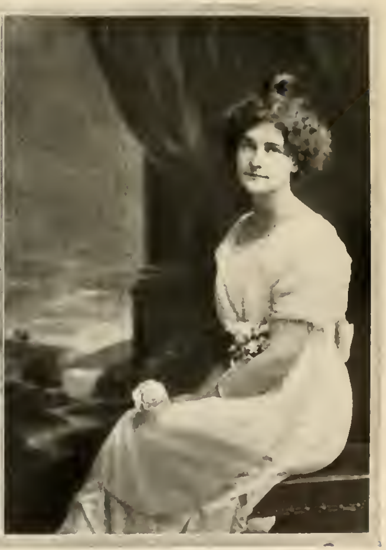


Fig. 5, from a photograph, shows the design to be reproduced, as well as the effect obtained from a plain ground negative worked upon as seen in Fig. 8. Figs. 7 and 8 show two stages of the work on the negative.

A Portico Ground

Our next pattern is also a very simple one and can be made in a few minutes. It is a balcony or portico, showing a column and curtain effect, seen in Fig. 5. Take a piece of stiff paper, draw the outline of the column with a pencil, and then cut it out with a sharp penknife, producing a mask, as shown in Fig. 6. Place the irregular side of the mask on the varnished surface of the negative where you wish the outline of the column to appear, and hold it down with your left hand so it will not move. Now charge your stomp with lead again, and darken all that part where the sky is to be, and somewhat lower, making the strokes *over* and *from* the paper mask so as not to lift or break the latter.

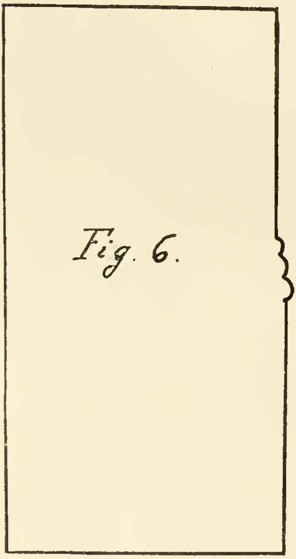


Fig. 6.

Put on as much lead as the varnish will hold, as there is little danger of its taking too much. Should that ever happen, a piece of chamois leather or cotton will remove the surplus. If desired, soft rubber will remove all of it. You have now a design on your negative like Fig. 7. Draw a few lines with your stomp to indicate the folds of the curtain, but do not make them too regular. A few heavier, short strokes should show the highlights where the light would naturally strike the folds. Now, take your soft pencil and draw the lines inside the column for detail, and also put on some touches for highlights. We now get to the outdoor part of the picture. There are two hills in the distance, a lake, and on the shore, trees and bushes, with a road in the foreground. First, outline faintly the different objects. The outline of the hills can be gotten by darkening the sky above with the soft pencil and by darkening the lake below. The tree and bushes we rub out with a pointed soft rubber, and the road we indicate with the soft pencil. After putting some highlights and detail in the tree and bushes, and darkening portions of the sky more than others, to produce a clouded effect, as shown in Fig. 8, we call this picture finished.

A More Difficult Design

We will now undertake to produce a more difficult design, that of a balcony, such as we see in Fig. 9. As before, we cut a mask for the column and then darken everything outside of it where we wish to work with the stomp, charged with lead or pastel or whatever coloring matter we are using. It should be understood that many other substances will answer our purpose as well as lead. This being the easiest to obtain, I have mentioned it more than others. Where more opacity is desired, a brown, red or orange pastel may be employed to even better advantage than lead. Rub it on with a piece of absorbent cotton where you wish to produce a smooth, even surface.

For our present design, a transparent celluloid ruler or straight-edge comes in handy to draw the necessary lines, as one can see better the spacing and progress of the work. Draw the lines as you see them in Fig. 9, the straight ones with the aid of the ruler just mentioned, and the curved ones by hand. A straight piece of glass will answer in place of the celluloid ruler.

We must now darken the sky as before with the soft pencil, heaviest near the top of the distant hills and gradually lighter toward the top; working for cloud effects. Next darken the lake below the hills, leaving it lighter toward the bottom.

The top of the balustrade should be as dark as can be made by the pencil, as it catches the most light from the outside. As the subject indicates, there is also light coming from the inside of the house, and therefore we put a highlight on the column facing the interior, and also on the little posts forming the balustrade. With a little work on the socket of the column, to bring out the

FIG. 10.

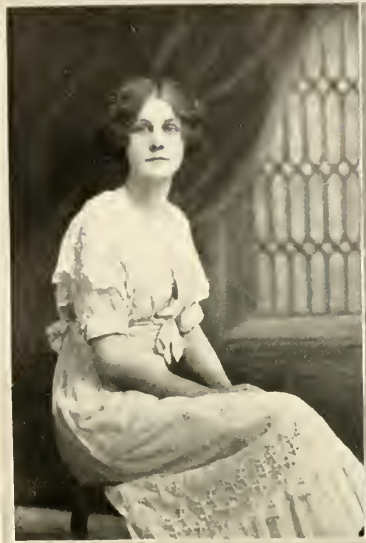


FIG. 9.

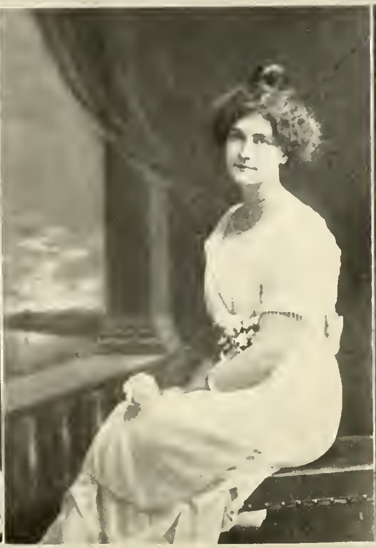
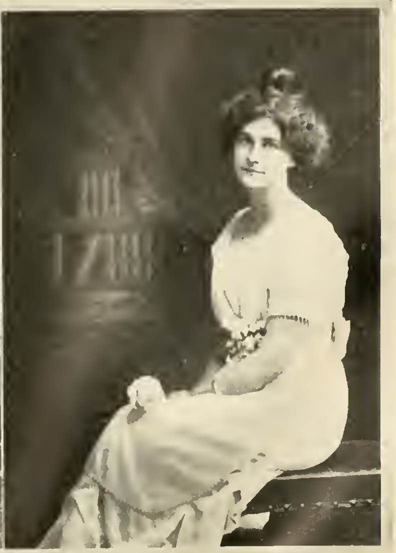


FIG. 12.



The designs are here reproduced from the finished photographs, showing the effects obtained by the methods given after working on the negatives made with a plain black ground.

detail, a curtain effect, practically the same as in the preceding design (Fig. 5), the background is finished.

When using celluloid sheets, the manipulations are somewhat different. Instead of placing the negative face down on the retouching desk, put it face up and the smooth side of the celluloid on top of the film. Then work the background design on the upper, matt side of the celluloid, the same as you would on the ground-glass substitute coating.

An Important Hint re Density

There is one thing I must call attention to in regard to this work, and that is the density of the designs. The denser the negative, the denser the design must be in order to print properly. If your negative is very dense and your design is too light, it will hardly show on the finished print.

On the other hand, if your negative is thin and delicate and your design very strong and opaque, it will come out altogether too prominent in the resulting picture. Therefore, both must be in harmony to produce good work. A little practice or a trial-print will soon show the right way.

A Window Design

The next attempt will be a stained-glass-window effect (Fig. 10), which is not very difficult, as we have mostly straight lines to deal with, which everybody can draw. Outline the window very faintly where you wish to put it, and indicate also where the curtain is to be. Now, darken the space outside of the curtain and subject, as in the previous cases, by rubbing on the color with a small wad of absorbent cotton, to get a smooth, even surface. Rub on as much as the varnish will take. Next take your transparent straight-edge or glassplate, and draw the horizontal lines in your window, as shown by the dotted lines in Fig. 11. After that draw the vertical lines, which should not cross the former.

Take a sharp instrument, such as the sharp point of an etching-knife or penknife, and go over these lines (using a ruler), and thus scratch away the matt varnish, leaving them clear and transparent. Don't use the knife on the horizontal lines, however, as they are drawn only to show where the vertical ones should stop. Now, cross the lines as Fig. 11 shows, to produce the small panes.

You will have to use the pencil again to darken all the long, narrow glass panes; but you may leave the little diamond-shaped spaces as they are. The casing has to be done next, and the woodwork below may be indicated by a few lines. After putting in the curtain effect, the background is finished.

When using celluloid sheets for this work the fine lines mentioned cannot be scratched in, as in the case of ground-glass substitute. They can be produced easily by using a rubber ink-eraser with wedge-shaped ends. These can be kept in proper shape by sharpening them on the finest sand-paper or glass-paper, when dull.

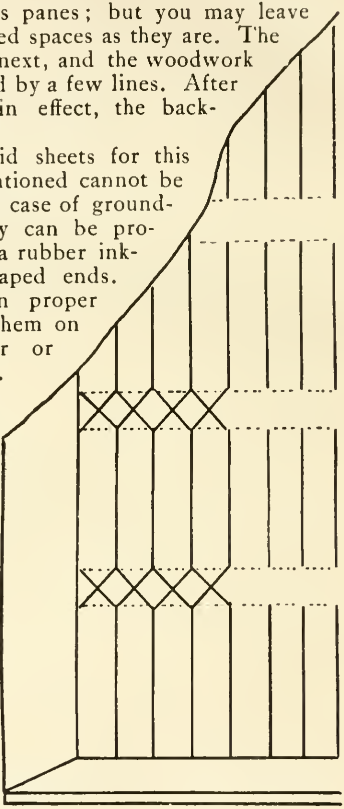


FIG. 11.

Suggesting a Library

A library ground is generally popular, and not at all difficult to make. Fig. 12 suggests a design of one which shows plainly how it is made, and I, therefore, shall not describe it, as this would entail unnecessary repetition.

I have only mentioned some of the simple, yet catchy designs, in order to explain the method of producing them. Numerous other designs can be gotten up, and hints for some may be found in catalogues, paintings, magazines, illustrations, etc.

There are other methods by which these grounds may be made. I have seen some made by the aid of the air-brush, others were made by using oil-colors, others by india ink. But the method here described seems by far the simplest, and the materials are so cheap and easily obtainable that I have chosen it in preference to the others.

SHADED VIGNETTES ON WHITE GROUNDS

We can now take up the production of portraits with a white ground, and the introduction of sketchy, shaded effects thereon. For light, dainty effects in portraits, especially suitable for pictures of children and women, there is nothing prettier than a worked-up white background. Here, instead of doing the work on the negative, as in the case of black backgrounds, this has to be done on the print.

There are two methods in general use: some employ the air-brush, others do it by hand. But, before we can take up a working method, we shall have to consider the background used in making the negative, because it is most important to have the right kind of a ground to work on. Many photographers find difficulty in producing a really satisfactory white ground. Some get them too gray, others too dense, and neither one of the two is very desirable for our purpose. For the most pleasing results, the ground must be vignetted, as only by doing this can we secure the clean, dainty effect we desire. If the original ground is too thin, and consequently prints too gray, we shall have a difficult job to get satisfactory results, for the picture will be surrounded by a dark band, which is hard to avoid, and never looks well. If, instead, the original ground is too dense, the picture will have a "pasted on" effect, which, though not desirable, is less detrimental than the first one, for here we can take the harshness away by our subsequent work.

The best ground for this work is the one which, after vignetting, leaves a scarcely visible, very light tint near the outlines of the figure; only just enough to to prevent these from being harsh and abrupt. There should be no difficulty to produce such a ground, if just a few things are observed. In the first place, the ground used should be perfectly white, not cream or any other color,except, perhaps, pale blue.

Next, be sure to place it where enough light falls on it to make it appear white. Remember, the whitest article won't look white in the dark, or, for that matter, in the shade, but do not turn it toward the light if you do not want a too dense and undesirable result; placing it at right angles to it should bring it out all right. By turning it from or toward the light, all kinds of shades can be secured; a little experimenting and the exposing of a few plates should soon put one on the right track for the desired result.

Exposure

Exposure has a good deal of influence on the final result. We all know, I suppose, that over-exposure will produce a thin, gray printing background. While, on the other hand, under-exposure will give us a denser, harsher one. All these conditions will have to be considered, and acted on accordingly.

Vignetting the Portrait

The next question is to properly vignette the picture.

It is really surprising to see how many fail in this comparatively simple matter by leaving a sharp, abrupt outline, and usually showing too much of the background.

Two printing methods are the most common. The majority of photographers use development papers and some kind of a printing machine, employing artificial light, and the smaller studios print by daylight or by artificial light in ordinary printing frames.

In a Printing Machine

When going to vignette a bust negative in any of the printing-machines (Artura, Ansco, etc.), all that is necessary for a first-class job is to put the negative on the machine, turn on the light and, after placing a piece of orange-colored "Post-Office" paper on top, draw a pencil line close around the head and down the bust, as you wish it to print. Cut out the part within the line, and place the so-formed mask under the negative about one-fourth inch below it. There is usually a plate-glass of considerable thickness on top of those machines, and putting the mask close to the under side of this will usually be about right. By utilizing the halves of plate-boxes into which openings have been cut, you can bring this mask nearer to or farther away from the negative as the case may require. The nearer the mask to the negative, the sharper the outline will be, and the farther away, the softer, as the light will spread more.

When printing from a negative with a thin background, the mask must be nearer the negative, to show as little of it as possible; and, when the ground is very opaque, a greater distance will be more desirable, to soften the outline. In three-quarter or half figures with black dresses, the light may have to be prevented from spreading too far by using cotton on the lower part of the negative, as in the old way of vignetting.

As these printing-machines usually have a large opening, 14 x 17 inches or more, it is a good plan to make several cardboard masks of the same size as the opening or top, and cut in each a rectangular aperture, to correspond to the different-sized negatives used. Paste a strip of stout opaque paper around the opening on the lower side, to form a rebate extending far enough to just cover the transparent edges of the negatives. This excludes all the light not wanted, and allows of smaller masks to be used when printing from a smaller negative on a large sheet of paper. It also keeps the negative in place and prevents it from sliding around. Of course, the cardboard masks must not be thicker than the negatives, or we cannot obtain contact. In case we have a very difficult case, such as a portrait with a dark ground from which a print with a white ground is desired, which sometimes happens when an old print is copied, the best way is to block out the old ground with opaque. To do this successfully, "dope" or prepare the negative as for retouching and outline the figure or head and bust with a six B. Koh-i-noor pencil, putting the lead on as heavy as possible. In this way you can produce an outline as soft as you wish, and then complete the job by opaquing out the rest of the ground as usual. This is far superior to using opaque right up to the outline, which leaves it altogether too sharp.

With Ordinary Printing-Frames

Those using ordinary printing-frames can obtain their white grounds as follows: About two sheets of tissue paper are pasted over the frame opening. The negative is placed in the frame and both are held against the light. With a very soft pencil a line is drawn on the tissue paper, closely outlining the heads or figures. Then, with opaque, all the tissue outside the outline is gone over, to exclude all light. The lower part of the negative is covered with a strip of absorbent cotton, which is given the shape in which one wishes the lower end of the vignette to blend out. The cotton, of course, should be "pulled" or frayed at the edges, to give a graded or blended tone outline to the vignetted portion. In the case of an original good ground, this should be all that is necessary.

Small Vignettes on a Large Sheet

In case we wish to make a print from a small plate on a large sheet of paper, a printing-frame of the proper size is necessary. This must have a clean glass on which the negative is fastened in the right position with gummed tape. A mask of opaque paper is then put over the negative, to protect the sensitive paper from all undesirable light. The vignetting is now done in the same way as mentioned before.

It is a good plan to put some strips of glass of the same thickness as the negative near the top and bottom of the frame. This will make the back of the frame rest evenly all over the sheet of sensitive paper, and will insure better contact over the negative.

As stated before, there are two methods in working up the grounds, which are the most popular—one with the aid of the air-brush, the other to work them up by hand. Not every photographer possesses an air-brush, and the latter method being simple, cheap and effective, we will select it for our work.

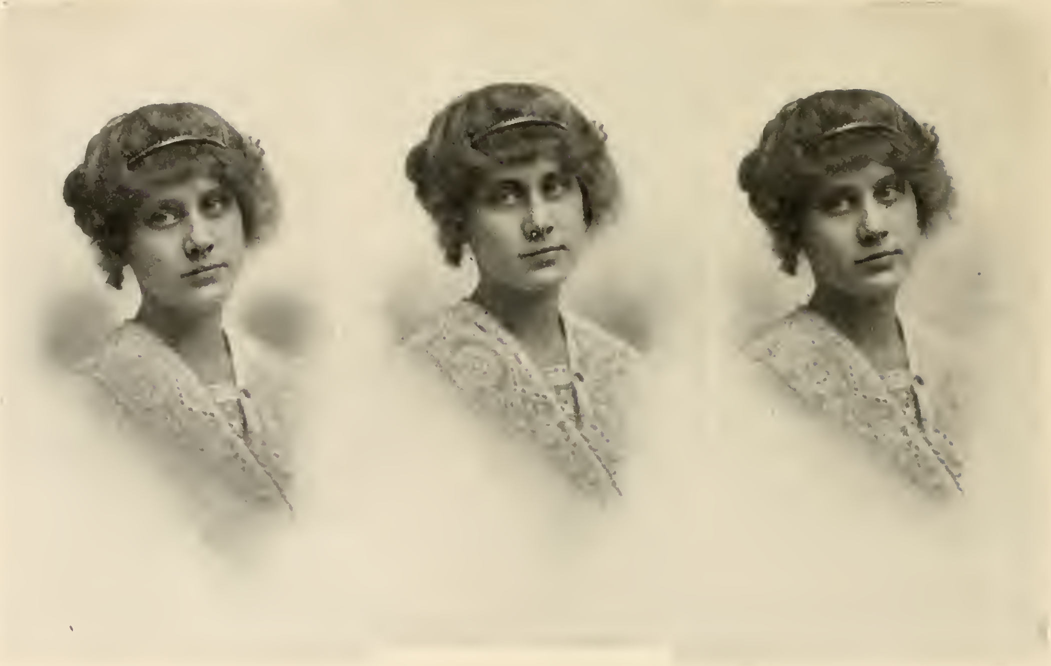


Fig. 13 shows the plain print with crayon powder roughly put on. Fig. 14 shows the effect gained by hand work as described. Fig. 16 shows the effect when mask (Fig. 15) and air-brush are used.

Working on the White Ground First, we need some crayon-sauce and some sepia pastel color, absorbent cotton, art gum, and a piece of rubber with wedge-shaped ends. The crayon-sauce is used for black-and-white prints, and the sepia pastel for sepia-toned pictures.

On a blotter or white cardboard we rub some of the color desired, and then take a small piece of cotton and roll or fold it up until it nearly comes to a point. With this we take up some of the color on the cardboard by rubbing over it lightly, and deposit some on the picture where wanted. Before doing this, it is best to try first on some clean place on the cardboard (or other useless paper) if we have not too much color on the cotton, and if so, rub off some of it.

Figs. 13, 14, 16 We will take a bust picture first, as this offers the easiest subject for a beginning. Fig. 13 shows a vignette with the color rubbed on in the first stage as described. The color should be rubbed on in one general direction.

Next, with a small piece of art gum we cut out the larger parts, and after this with the sharp edge of the rubber we put in the sharp dashes, and to complete it we take a large wad of cotton and rub over the whole quite energetically in the direction in which the dashes and general design go. This softens the whole work and produces a more pleasing effect. Rub right over the whole picture and don't be afraid of soiling it, for it does not do so. Do not hesitate to go over an outline, for you can easily clean it off with your rubber. In fact, it is less bothersome to do that than to take great care and waste time unnecessarily.

Fig. 14 shows the finished picture.

Fig. 17 shows a finished picture of a three-quarter-length figure. The manipulations employed here were the same as in making the bust portrait previously described, and need not therefore be repeated. These examples somewhat resemble wash-drawing effects, and are quite simple. More elaborate designs may be used if desired, but I think the simpler they are, the better. A very little practice on the lines laid down will bring the required dexterity in handling different subjects.

Using an Air-brush

A slightly different method is used when an air-brush is employed for this kind of work. To imitate with the air-brush effects like the ones shown, a mask is cut out of a piece of blotter (see Fig. 15), and by holding this in place on the print a light spray of color is put between its inner outline and the subject, which, upon removing the mask, shows an effect very similar to that secured by hand in Fig. 14.

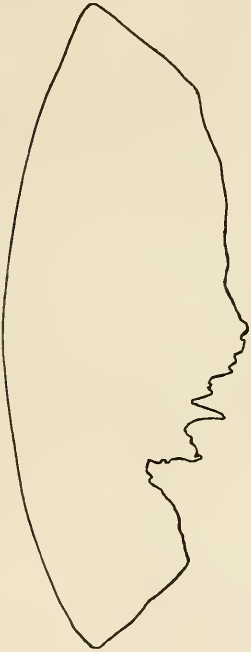


FIG. 15.

Fig. 16 illustrates this clearly. Blotting-paper for masks is far superior to other material, as it immediately absorbs all superfluous color, and thereby prevents the picture from being soiled on its removal. Light dashes can also be put in with the wedge-shaped rubber.

Sort of Paper to Be Used

The surface of the paper used for these shaded vignette portraits should be neither too smooth nor too rough. If too smooth, the colors will not adhere so well as is desirable. If too rough, the work done by hand may appear too rough, too, and in that case the air-brush is preferable, as the spray of liquid color from it enters more into the pores of the paper, and therefore looks smoother. When working by hand on very smooth papers, the dry colors can be made to take better if mixed with some powdered pumice-stone, which, in rubbing on, roughens the surface enough to make the colors adhere.

Such paper as Cyko Plat, Cyko Buff, Artura D and

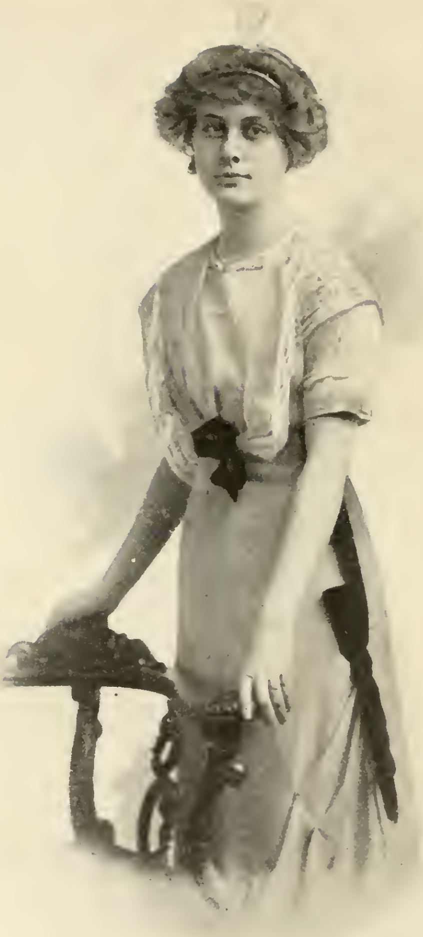


FIG. 17, showing the effect gained by working a three-quarter figure as described on page 294.

Buff, Carbon Azo and Buff and similar others are very suitable for this class of work. The regular platinum papers are very easy to work on, and are recommended for this work.

ETCHING NEGATIVES AND POSITIVES

The Film of a Plate

By examining the photographic dry plate it is easily seen what an extremely thin layer of gelatine emulsion covers the glass plate, which, after exposure, development and fixing, contains the permanent image of whatever object was photographed upon it.

Although the silver which forms the picture permeates the gelatine emulsion evenly throughout, the actual image rests on the surface only, and only the very highest highlights penetrate the film deeply, and rarely so far as the glass support. Nobody knows this better than the man using the etching knife.

The layer of blackened silver which forms the image is so extremely thin as almost to defy measurement; yet, under the knife of the skillful etcher, any shade from the blackest black to the lightest gray can be produced.

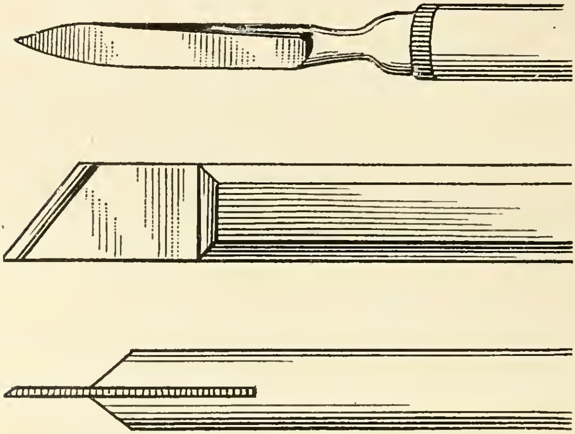
What Etching Means

Etching may be a misnomer, but in the retouching department of a photographic studio we understand it to mean the altering or removing of parts of the image on a negative or positive with the knife, or the local reduction of over-dense portions.

The process itself resembles very much the erasing of ink with an ink-erasing rubber. By going lightly over the black silver image on the negative with a sharp knife, we can gradually lighten it (i.e. reduce its density) until it gets lighter and lighter, and finally disappears altogether. That this is no easy matter the beginner will soon find out. A very steady hand and an excellent knife are absolutely necessary to do this work successfully. The latter can be ordered from any first-class cutler, and the former acquired by practice.

Etching-knives Strange to say, there is not a first-class etching-knife on the market today—I mean one that an experienced etcher would use by choice.

Two knives are needed for the portrait etcher's outfit. One for etching small parts of negatives, and one larger one for working on a large negative. The one I use for small work has a shape like Fig. 18, and the one for large work is called broad-knife (see Fig. 19, side-view, and Fig. 20, front-view). Note that it is sharpened like a chisel, on one side only. (Other useful etching-knives are shown at page 357 of THE PHOTO-MINIATURE: No. 116 "Hand-Work on Negatives" [Editor.]



FIGS. 18, 19, 20, etching knives.

For a small knife, a surgeon's scalpel of the proper size and shape will often answer the purpose admirably, while the larger one has to be ordered from a cutler. The blades of either one must not be flexible; they must be stiff, or they are useless. They must be as sharp as a razor, and are best sharpened on a razor-hone or similar fine-grained stone. They must never

Fig. 21.

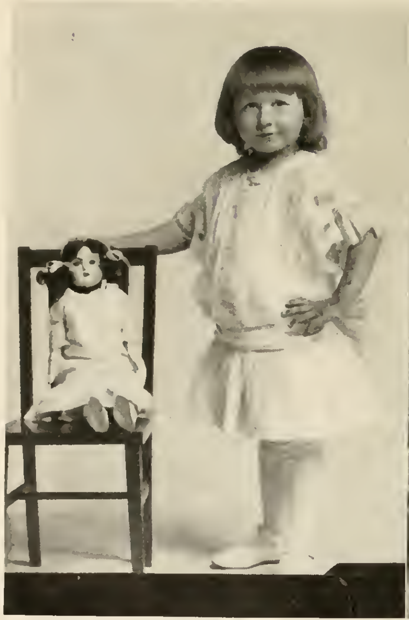
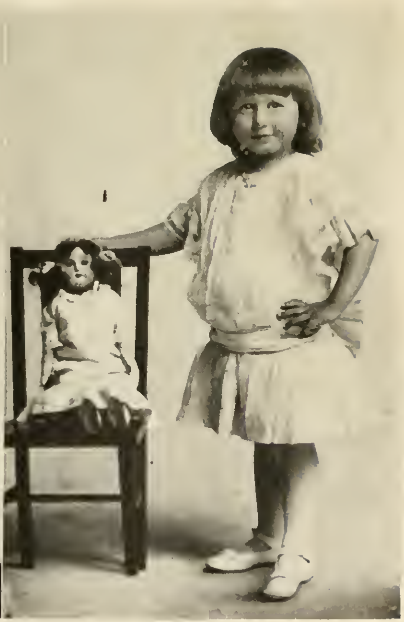
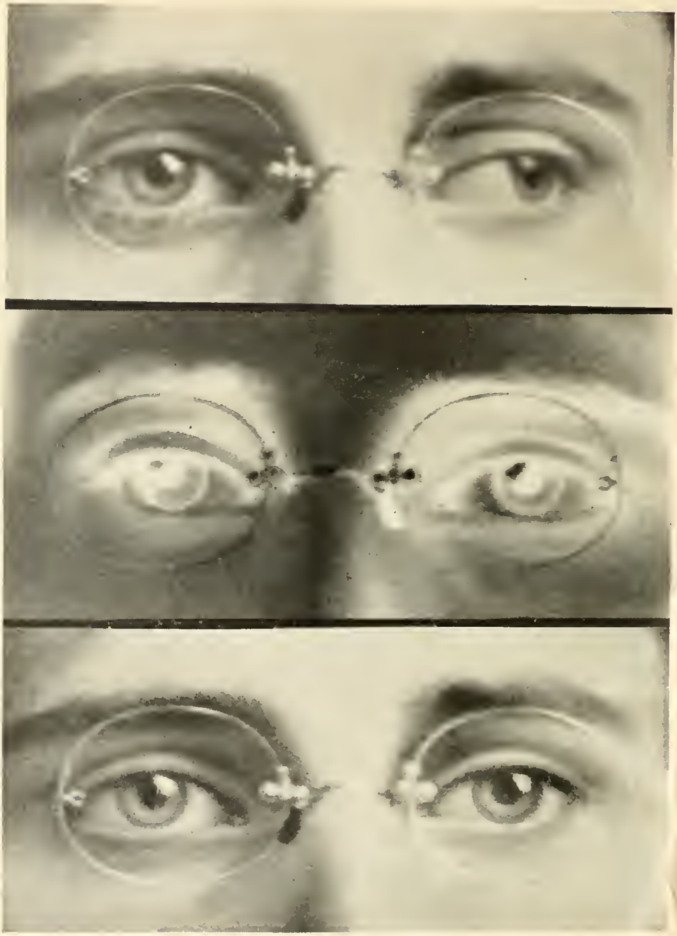


Fig. 22.



In Fig. 21 the figure was photographed too low on the plate, cutting off part of one foot. Fig. 22 shows the finished effect gained by the method described on page 301.



Straightening Cross-eyes with the Etching Knife.

Fig. 23, from a print showing the eyes in their original state.
Fig. 24, from the negative after part of the work of straightening the eyes.
Fig. 25, from a print showing the process completed. See page 302.

scratch, and must leave a smooth, even surface when going over the film with them. The hardest things in etching are, first, to get the proper knife, and second, to keep it in first-class order. The rest is comparatively easy.

For all small work the small knife is used, while for large areas a broad knife will be better, as the work can be done more quickly and more evenly with it.

The Knife's Usefulness

It is safe to say that the etching-knife is one of the most useful tools in the retouching department, and its uses are so many that it is almost impossible to recount them all.

There is the cross-eyed man or woman who wishes that fault corrected; there is one who wishes a crooked nose or a too prominent cheek-bone improved, stray hairs must be removed, also wrinkles in dresses, hair darkened, moved figures sharpened, undesirable parts softened or removed in the figure, and what not.

These things are of the every-day variety. What else can be done will be shown by the following different examples.

Fig. 21 shows the picture of a little girl which, by an oversight, was taken too low on the plate, and one foot was cut off by the plate-holder.

The child lived in another town and could not be photographed again, so that the mistake had to be rectified or the order lost. To do this, a transparency was made first in a larger printing-frame. This, of course, looked like the picture Fig. 21, all the lower part of the picture-image being black. This black bottom was gone over with the etching knife until it was of the same color as the floor-cloth; the foot was drawn in and a new negative made, from which a print is shown herewith (Fig. 22).

This sounds all very easy, but the man who has not much experience in drawing may find it more difficult than it appears. If he is not familiar with drawing the human figure, or parts thereof, he can usually find some other negative which contains the part he has to work in, and use that as a model to copy from. He will find it advantageous to draw the outline first with a pencil after the negative is "doped." The penciling can be removed with dope and cotton as often as desired until the drawing is satisfactory. In most cases, both etching with a knife and retouching with a pencil will be necessary to secure a good printing negative, without the work showing in the print.

How to Use the Knife

In etching, use the knife in one direction only, not as you would use a rubber. Try it first on an old negative and find out at what angle it works best, and then go ahead on your regular work. Use it very lightly at first, until you get to feel sure of yourself. *Never* remove all the gelatine film when etching, and do not etch away more than is absolutely necessary. The fault most beginners make is going too deep with their work.

Avoid etching on the face of a portrait after it is retouched, as the knife work almost invariably shows in printing. If necessity compels such work to be done, varnish the negative with a good negative varnish after the etching, when the work will not be so noticeable in the print.

Straightening Crossed Eyes

Our next problem will be to straighten the eye of a cross-eyed person. Fig. 23 shows the eyes as they were in the subject photographed. In changing the defective eye, we pay no attention to the iris and pupil, but etch a new one where it should be to match the other eye. After this is done, whatever is left of the original iris and pupil is retouched out. If done well, both eyes should be exactly alike. Such work is best done under a good-sized magnifying-glass. To be safe, make a proof first, and see that the work is correct before finishing the order.

In finishing the eye, several things should be closely observed to get it to look well and natural. Do not draw the iris round as a circle, notice that the upper part is partly covered by the lid. Put a catch-light in the proper place, and see that there is a little light on the other side of the pupil. Both of these lights give life to the eye. Use the good eye as a model, and copy this faithfully in every particular. Fig. 24 shows the work started, and Fig. 25 shows it finished.

It is very important to study the eye well, for it may

FIG. 26.

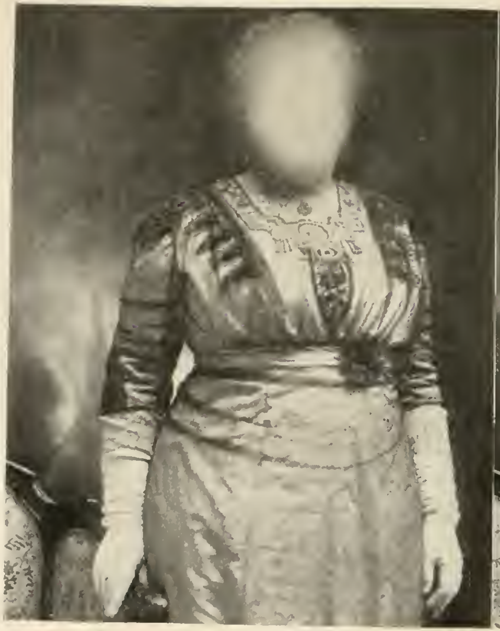
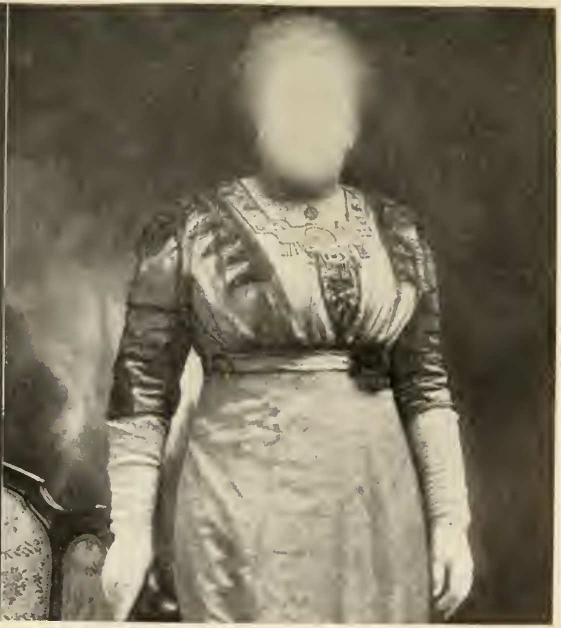
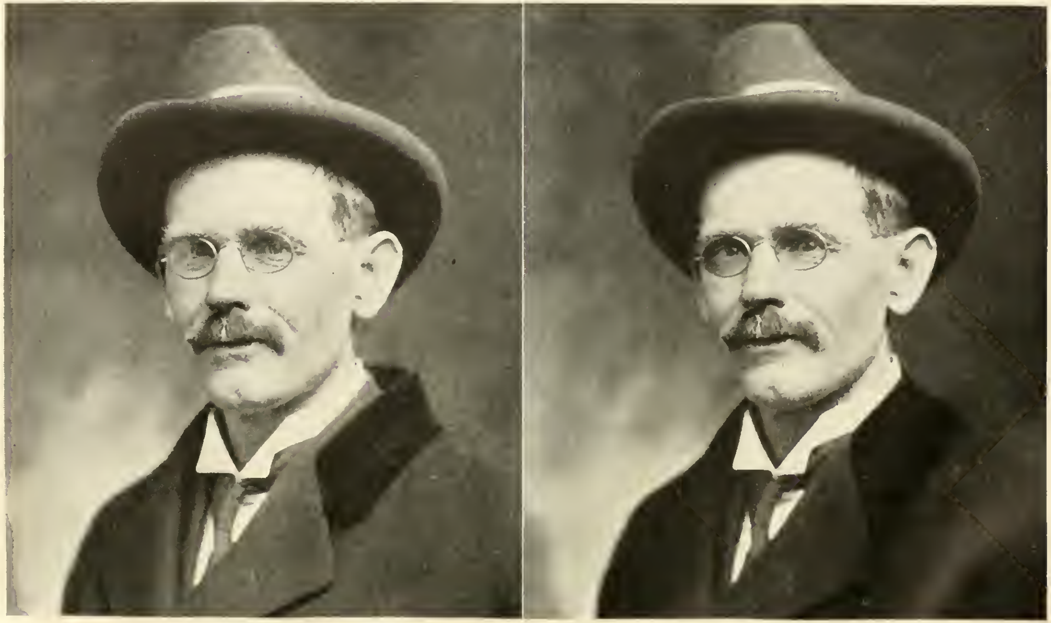


FIG. 27.



Here the problem was to remove the unsightly shadows crossing the skirt and correct the fullness of the figure. See page 305.

Fig. 28. Fig. 29.



In the original negative (Fig. 28) the overcoat is seen to have slipped down below the coat. In Fig. 29 this defect is removed. See page 306.

not only be necessary at times to make mere correction, but sometimes we may be called upon to make or put in new eyes. This may happen that, when taking a flashlight of a group, one or more of those in the group winked or blinked when the flash went off, and their eyes appear closed when the plate is developed. It is in many cases impossible to retake the group, as the gathering may have been a temporary one, the different members having scattered afterward. Unless new eyes are put in for those who had them closed, the order, which may be a valuable one, may be lost.

If the construction of the eyes has been carefully studied, there ought to be no great difficulty in accomplishing this task. It should be done under a good-sized magnifying-glass, to make it easier for the eyes of the etcher, and to do the work cleaner and more accurately so that it will not show.

Re-Shaping the Figure

A frequent demand made on the etcher is to reduce the shape of a stout lady, and we will now show how this is done. Fig. 26 shows the print from the negative before etching, and Fig. 27 shows the print from the same negative after the work is done. On the first picture you see the skirt and the lady's right side go way over to the arm and hiding a small part of it. A big piece was etched away, and made to match the color of the background. Right under the arm some retouching had to be done, as that part came over a part of the sky in the background, which shows through the trees, and, of course, had to be made light with the pencil instead of dark by the knife.

This was done in a way to make it look like another tree-top, of which several show in the background outside of the arm.

The work on the lady's left side was started on the waist. By etching down that light part, it was made the same shade as the sleeve, and added to the arm.

You will see that the skirt covered part of the lady's left arm and hand. Part of that side was added to the arm and hand, by both etching and retouching. The upper (dark) part of the arm was made nearly twice as wide. Yet, by carrying the little folds across the new part, it resembles the original part so closely that no one could tell the difference on the finished picture. Some dark folds in the dress, too, had to be modified; one particularly heavy one right under the belt was especially displeasing. The finished picture shows how they were lightened up by the retouching pencil.

In this kind of work it often happens that one has to turn parts of dresses into parts of backgrounds for furniture, and the ingenuity of the etcher is sometimes taxed to the limit. However, the satisfaction one gets from a successful bit of difficult work repays the trouble to a great extent. In a case like the one mentioned, the operator should always pose his subject before a dark ground, as this makes it much easier for the etcher to do the work quickly and well.

Changes in Clothing

Fig. 28 shows the bust portrait of a man who wanted to be taken with overcoat and hat on, for a certain purpose. It was not noticed by the photographer when the picture was taken that the overcoat had slipped down near the neck, showing part of the coat underneath. This was found objectionable and had to be corrected on the negative, as a re-sitting was not possible.

The black velvet collar is considerably darker than the background, and has to be lightened by the retouching pencil, where it sticks out beyond the desired outline, until it is of the same shade as the background. That part of the coat which shows between the velvet collar and the white collar has to be etched until it is as dark as the velvet collar, which brings the latter up to the white collar, where it should be. This etched-on addition, however, makes the velvet collar too wide, and part of it has to be cut off to make it of the same width it had before the etching. This is done at the bottom with a retouching pencil. Fig. 29 shows a print from the finished negative.

Repairing a Broken Group Picture

Fig. 30 is a print from a broken ambrotype, after the pieces were put together and copied on a new plate. Ambrotypes were negatives made by the old wet-plate process, and, after being given a coat of black varnish on one side, were put in cases like

FIG. 30.

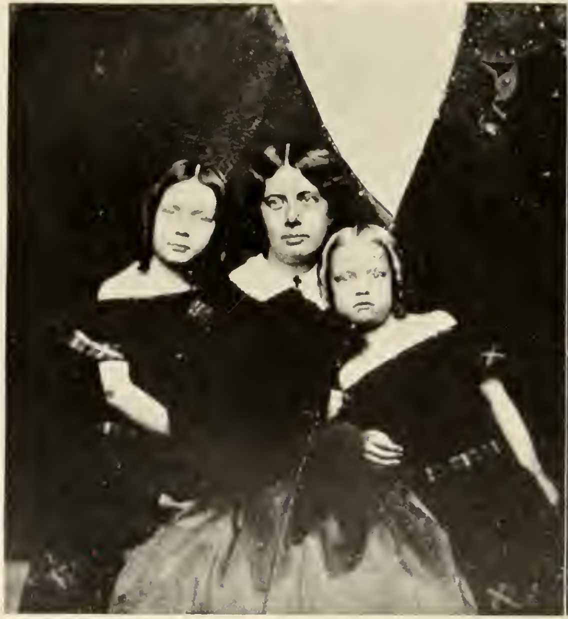
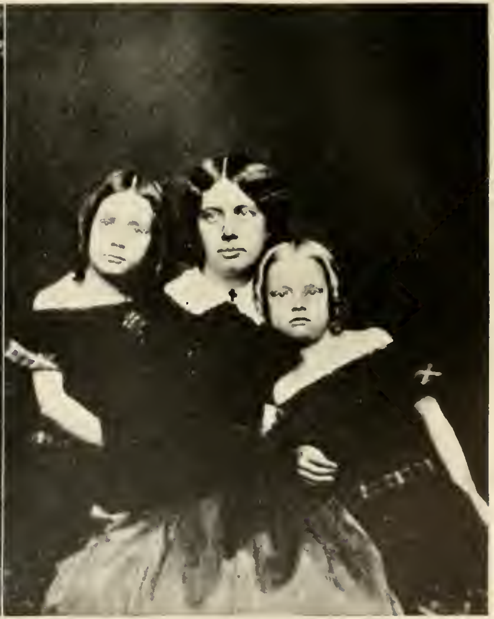


FIG. 31



Here, in Fig. 30, we have a print from a badly broken Ambrotype, with a piece missing. In the original print the cracks and defects are worse than they appear in this reproduction. In Fig. 31 we have a print from the copy negative, all the defects being remedied by the method described on page 306.

Fig. 32.

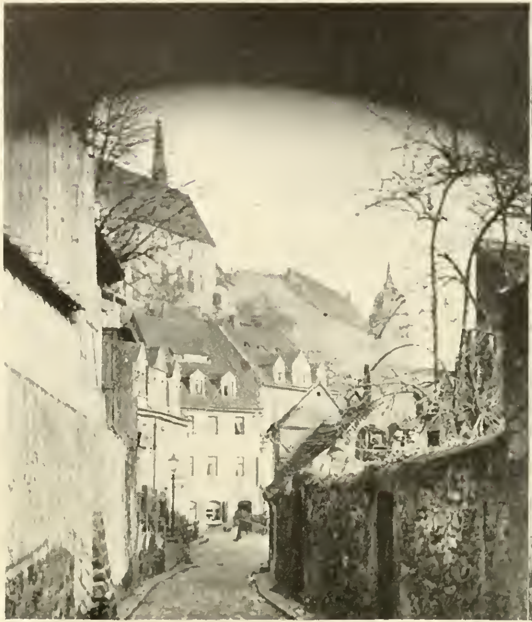
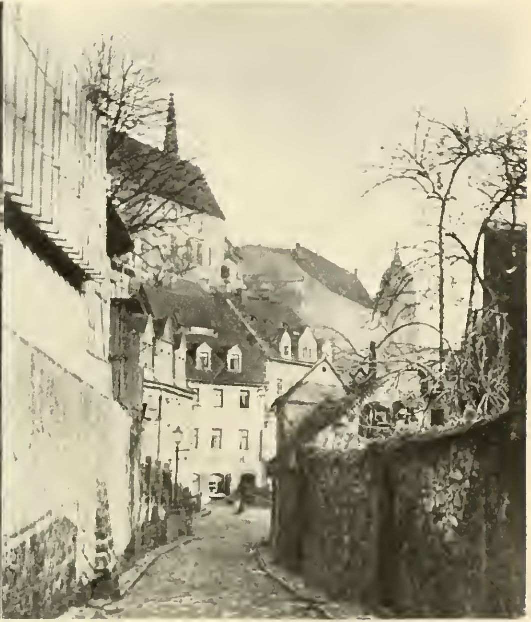


Fig. 33.



This is a remarkable bit of knife and pencil work for the saving of a view. In Fig. 32 we have a print from the original negative. Fig. 33 shows a print from the duplicate worked-up negative, but much of the improvement seen in the print is lost in the somewhat harsh halftone reproduction. See page 309.

daguerreotypes, and were often mistaken for such by many people. In this one you see that the plate was broken right across the face of one of the girls, cutting that one's eyes in two. A good-sized piece was also missing from the background.

The pieces were carefully put together, a negative made by copying them the same as any other picture, and then the lines were etched and retouched out. The pieces had been copied in a printing-frame with a light back, which shows through the missing part, and this was toned down by the etching knife until it resembled the rest of the ground.

The original was a rather poor specimen of that kind of pictures, being very contrasty, with little detail in the shadows. Nevertheless, the new negative shows all there is in the original. Fig. 31 shows a print (not the best possible) from the finished negative.

Improving a Faulty View Negative

A rather interesting piece of work is shown in Figs. 32 and 33. The view seen in Fig. 32 was taken in a hurry. It was not noticed at the time that the light-circle of the lens did not cover the whole of the plate, resulting in the upper portion of the view being lost in darkness.

The tree branches reaching into the sky prevented the dark part from being vignetted in printing, and the negative was considered lost. Many months afterward I happened to run across it again, and, studying and looking it over, I decided on a method to restore it.

I first coated the glass side with ground-glass substitute, and tried to darken the upper part (which was as clear as clear glass) with the stomp and dry colors, but soon found out that it would not take half as much color as was necessary for my purpose.

Then it occurred to me to use the air-brush, and that finally solved the problem. By going over the faulty portion lightly and quickly, and allowing the color to dry before using a succeeding application, I prevented the color spray from running, and so managed to darken the space sufficiently where it was needed.

The greatest difficulty was the gradual blending of the erstwhile black into the almost white part of the sky, and to avoid showing the line where they met. This was accomplished on the transparency which was made from the so-worked-up original negative. On this were also drawn in the tree branches and the top of a fence, which were cut off in the original negative. A good deal of very careful retouching under a magnifying glass was done on the sky, too, for the grain produced by stomp and air-brush showed rather coarser than was desirable. To get more contrast and snap, the roofs were darkened on the transparency by the use of the stomp and color, on the ground-glass substitute with which the back was coated.

After completing the work on the transparency, a new negative was made from it by contact. There was very little work required on this. As you can see for yourself, the new negative is superior to the original, and the print from it (Fig. 33) does not show the hand-work put on it. In fact, one not knowing the circumstances would never suspect it to be a print from a duplicate negative.

By the way, the transparency in this case and also the new negative were made by the light of a match.

Another method could have been used to obtain a faultless negative from the spoiled one. A transparency could have been made from the original negative, without having done any work on the latter. The dark upper part could have been lightened by the broad-knife, the tree-top and part of fence could have been drawn in, and then a new negative made.

But the first mentioned method is the better. For, in the latter, the danger exists that, by shaving down the dark part until it gets light enough to match the rest of the sky, the gelatine coating will be so thin that any retouching on it would be very difficult.

There are usually various ways by which to attain certain results, but I have purposely described the less risky and easiest ones.

Vignetting a Head Out of a Group

In Fig. 34 we have the picture of a boy who was taken in a group, but who is wanted alone. This would be a simple matter if the boy were standing or sitting straight, for all we need to do in that case is

Fig. 34.

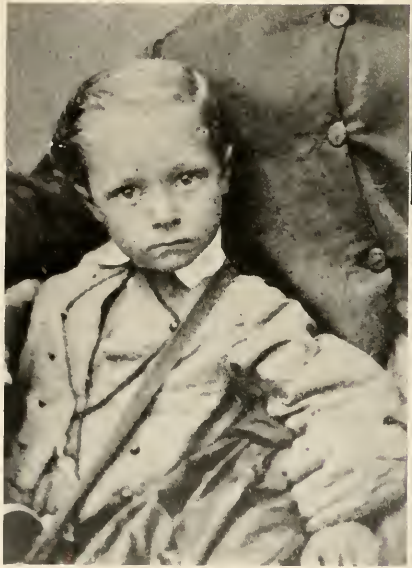


Fig. 35.

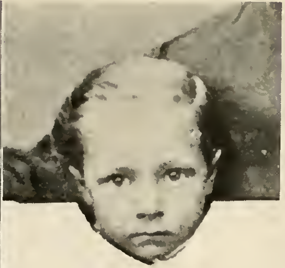
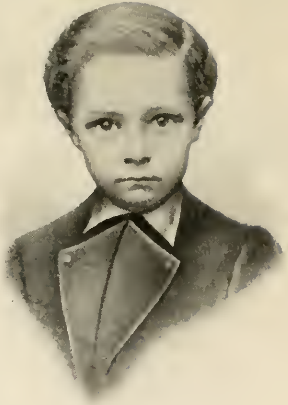


Fig. 36.



A clever example of obtaining a vignetted bust portrait of a boy from a group picture presenting special difficulties. See page 310.

Fig. 37.

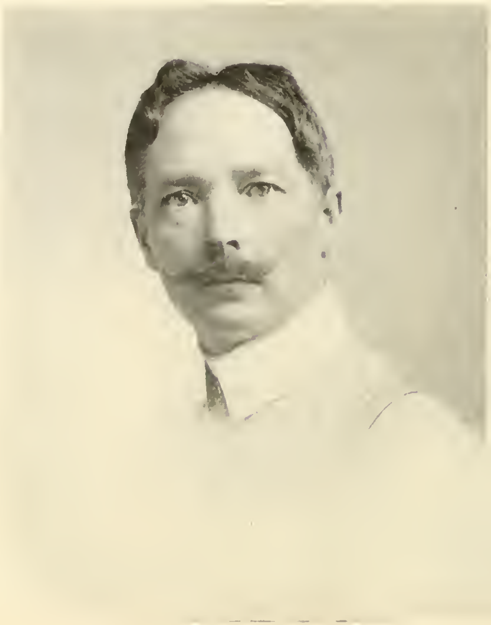
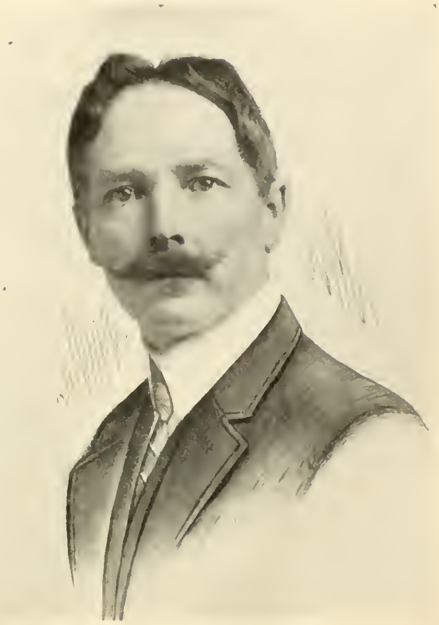


Fig. 38.



White-ground portraits with pen-and-ink sketch effects. See the method described on page 313.

to block out the rest with opaque on the negative after the picture was copied. But, as the boy was taken in a leaning position, this would not be satisfactory. So a piece of white paper was put over the part below the head, and the picture, so covered up, put in a printing-frame with clear glass and a negative made of it. The resulting picture appeared as Fig. 35. Now, with the etching knife a new coat was etched out of the white ground, imitating the original coat as closely as possible. Then the upper part was opaqued, the face retouched, and the hair etched. From this negative a print was made, and some work put on that. The outlines were softened, the hair improved, and a little background worked in. Fig. 36 shows the picture completed.

Pen-and-Ink Effects

In order to produce portraits resembling pen and ink drawings, the negative must be taken especially for that purpose. The person is posed before a white background, and immediately in front is put a white card on a head-rest, or other support, on which it can be raised or lowered. In the upper side of this card (a blotter will do) a cut is made of V-shape. Put this card just in front of the subject, to vignette off everything below the head, only a part of necktie and collar showing through the V-shaped cut-out. The card should catch sufficient light to come out quite white and leave an almost opaque ground below the head. Fig. 37 shows a print from a negative so taken.

The usual vignetter will not do. For, in order to get rid of the coat, it would have to be raised so high that the "teeth" of the vignetter would extend into the face and cut off too much.

Etching the Film

No soft vignette is needed, as the whole background is opaqued out afterward, anyhow. Do not do this until everything else is completed. Draw the principal lines first with either a pencil on the film-side, or with a wax-pencil on the glass-side of the negative, to see if they suit you. The foreground, although pretty dark, will have enough transparency to allow this being done. After you have them placed to your satisfaction, proceed to etch them in the gelatine film with the extreme point of the knife. When that is done, do a little shading where necessary; put a few delicate lines around the too sharp contours; also a few sketchy strokes on the background, and then opaque out whatever is not wanted. Before doing the latter, go around the outline of the head, etc., with a 6-B Koh-i-noor pencil, to soften it, and don't let the opaque come right to the figure. Fig. 38 shows the finished picture. Those who find it difficult to draw the necessary outlines without a guide to draw from can take a second negative with the cardboard removed, make a print from that, and copy from that what they desire.

REPAIRING BROKEN NEGATIVES

There are few things more distressing than to see one's most valued negative in pieces on the floor! Or what is still worse, if some one else's pet negative was entrusted to you for some work, and after you were duly informed of its importance, either you or your assistant had the ill fortune to break it! Can you think of anything worse?

With what a sad face were some of the pieces held up against the light once more, and then swept out with other rubbish, and that was the last of it. A sad tale indeed, and especially sad in so far that nearly nine of every ten of these broken negatives could have been saved, had it been more widely known how a new negative could have been made from those pieces, not in the least inferior to the original. There are hundreds, perhaps thousands of photographers, today, who throw the pieces of a broken negative away, never thinking how easily they could get a new one from them. It is surprising that so very few ever thought of the simple remedy in such a case.

And what do we see in the photographic press about it? How often do we see anything in either the weeklies or monthly magazines pertaining to this most important matter?

Whenever we do see anything about it, it is usually the same old advice: "Strip the film (if film is unbroken) and transfer the same to a new support. If both film and glass are broken, there is no remedy." Now, how many of us have the necessary experience to strip a film with any assurance of success! Probably nine out of every ten attempts would prove failures and, should we fail, our negative would be lost forever.

A Sure Method

There is only one absolutely reliable method by which we can repair a broken negative, and that one is to put the different pieces together as accurately as possible, make a transparency from them, and from this transparency get a new negative.

Of course, there will be lines showing wherever the pieces were joined, usually light and also dark ones. But all we have to do now is to eliminate these lines on the transparency, the dark ones with the etching knife and the light ones with the retouching pencil. After this is done, we make from this transparency another negative, which should be as good as the original one in every respect, if each stage of the work was carefully done with knife and pencil.

A New Advantage

With this method, we not only can get a new negative equal to the original, but we can even improve on that if it needed it. For instance, if the original was flat, we can develop the transparency with a contrasty working developer, and thus get more snap in the new negative, and vice versa. We can hold back certain parts and emphasize others. We can put ground-glass substitute on the back of it, and by scraping away parts, and darkening others, we can change the character of the new negative completely. Those who have never attempted the making of transparencies and duplicate negatives, will be surprised to see how easily this can be done, and by what simple means.

With an ordinary printing-frame, common dry plates, and a match as an illuminant, I have made duplicate negatives equal in every way to the original, and in certain cases superior. The method here given is as sure as it is simple in practice.

The Method in Detail In the case of a broken negative proceed as follows: Take a printing-frame (with a clean glass in it) a size larger than the negative; a 5 x 7 frame for a 4 x 5 negative, a 6½ x 8½ frame for a 5 x 7 negative, etc. Put the pieces carefully together on the glass in the frame, after the glass side of each piece has been carefully cleaned. Be sure to register them correctly in the center of the glass. Take pieces of heavy gummed paper (lantern slide binding strips will do) and, after moistening them, put them on the glass near the pieces and slide them up to them, just touching them. Do this all around the broken negative until all the different pieces are fixed in their respective places, each one as close as possible to its neighbor. If this is done carefully and correctly, the pieces should hold well together, and not move at all. All we have to do now is to go into the darkroom, put a sensitive plate in contact with this negative, and make the exposure as usual.

Making the Transparency As stated before, I usually make this transparency with a lighted match, which I move, about ten or twelve inches above the frame, for a second or more, according to the density of the negative, and then develop as usual.

I know this method is open to criticism, as the match as an illuminant is of rather an uncertain quality and quantity, but it has given quite satisfactory results with me. No doubt a more certain illumination would be better if we had many such jobs to do; but as there is rarely more than one at a time on our hands such a makeshift will answer. It has an advantage over other lights in that it is a rather feeble one, and gives more latitude on that account.

If one side of the negative is denser than the rest, the match can be held just an instant longer over that part, and a more evenly exposed transparency is the result. I usually light the match under a shelf, and do not hold it over the printing-frame until it has come to a good flame. If others prefer different ways of doing this, they can do so and choose their own method; I merely wished to show by what simple means excellent results could be achieved.

It is very important to expose correctly, and either over- or under-exposure must be avoided. Be sure to *develop fully*. Most beginners in this method err in under-developing. The transparency for our purpose should not be like one intended for a window decoration or lantern-slide. It should be considerably darker or stronger in contrasts, and there should be no clear glass anywhere. In fact, it does not matter how dark it is, so long as the highlights and shadows are in the right gradation. The density will only mean a longer or shorter exposure afterward for the new negative. Not enough emphasis can be laid on the fact that this transparency must be absolutely right, or the new negative will never be what it should.

Working on the Transparency

After we have succeeded in producing the right kind of transparency, we must work out the lines. The light ones will present little trouble to the experienced retoucher, and even the novice will be able to retouch them out after a little practice. All he has to do is to put some of the retouching dope over them, and go over them with a soft retouching pencil; a 2-B Hardtmuth Koh-i-noor or other similar pencil will work well.

The dark lines must be erased by the etching knife, and that work is more difficult to do. A more detailed account of this work has already been given under Etching Negatives and Positives.

Making the Negative

After we are through with the work on the transparency, we make a negative from it by either the same method as before, or we can make it in the camera. Should this show any traces of the lines from the breaks, we can retouch them out completely on this new negative. There is a difficulty encountered sometimes in doing this, it being almost impossible to prevent them from showing to some extent on the last negative, even if the work seemed perfect on the transparency. This is caused by the difference of color in the pencil and the negative; one perhaps having a yellowish and the other a bluish tint. Should this be particularly bothersome in some cases, for instance, if enlargements are desired from the new negatives a good plan would be this: Make a print on some either glossy or semi-glossy paper, spot out the lines carefully under a magnifying glass with a color exactly matched to the tone of the print, and then copy this so-treated print.

It will be easier to match a color to the tone of a picture than to find a pencil of the exact color of a negative or transparency, and a good negative from a glossy or semi-glossy paper should show no perceptible grain.

The few methods described by no means exhaust the wonderful possibilities open to the photographer who will acquire a little skill with the etching knife, retouching pencil, and transparency making. But they may serve to show the advantages of this knowledge and skill, and so incite the reader to make himself familiar with both the tools and their successful use. I have tried to make the methods plain, and have given only such as experience has proven reliable and workable without difficulty. May they be useful and profitable to my fellow workers in the magic art.

CARL A. BERGMANN.

EDITOR'S NOTE.—For a full discussion of the use of the knife, stomp and pencil in the improvement of landscape and view negatives, with illustrations, see THE PHOTO-MINIATURE No. 116, "Hand-Work on Negatives."

Notes and Comment

Of unusual interest to the reader in search for an anastigmat is the announcement that The Munchener Optische Industrie Anstalt of Munich, Germany, has opened an American branch (Allendorf Co., 306 New England Building, Cleveland, Ohio). The M.O.I.A. specializes in the grinding and mounting of photographic objectives, and its research work in this field has resulted in several objectives of very advanced types. The M.O.I.A. output at present consists of fifteen lens series, embracing seven series of anastigmats of both the air-cell and cemented type, with speeds ranging from *f* 6.8 to *f* 3.8. The latter series is especially recommended for professional portraiture.

In addition, the M.O.I.A. line includes portrait lenses of extreme speed, *f* 3; aplanats, wide-angle, cinematographic and projection lenses. The latest introduction is the double anastigmat apochromat "Polymar" *f*/6, which offers special advantages for color separations in three-color process work. The catalogue of the M.O.I.A. will be ready in a few days, and I suggest that every reader of THE PHOTO-MINIATURE should send a postal card to the Allendorf Co. for a copy. It is bound to be interesting reading.

When it comes to the use of blotting-paper in photography, one cannot afford to run any risks. I have used "Photo Finish World" for some years with perfect satisfaction and great economy, so that I can recommend it to the reader with confidence. "Photo Finish World" is a 100 per cent pure cotton fiber, made expressly for photographic purposes, very absorptive, non-linting, guaranteed to be free from anything that could injure the photographic print. It is durable, has a hard finish, and is very economical in use. Any photographer who would like to test this paper and wants to be sure that he is really testing "Photo Finish World" should write to the makers for a sample sheet. Made by The Albemarle Paper Mfg. Co., Richmond, Va.

The best way to try a new photographic paper is to write to the manufacturer direct for samples. This insures fresh paper and the most liberal return for the extra trouble involved. The Photo Products Co., Dept. X, 6100 La Salle St., Chicago, Ills., are making a special offer of three sample dozens of their Instanto and Platora papers at 25 cents. In writing for these samples, be sure to address Dept. X. Large professional users of development papers can obtain samples by writing on their business stationery, without charge.

Two interesting folders concerning Eurynar lenses can be had by sending a post-card to the W. J. Lafbury Co., sole American agents, 305 North Fifth Avenue, Chicago, Ill. By mentioning THE PHOTO-MINIATURE, you will get special attention.

By an obvious blunder in the advertisement of Voigtlander & Sohn in THE PHOTO-MINIATURE No. 124, the types said that the Dynar *f*/6 "is just as efficient in point of speed and definition as the ordinary rapid rectilinear." Of course, this statement was and is absurd, the Dynar *f*/6 being "just *eight times as efficient* in point of speed and definition as the ordinary rapid rectilinear." In order to obtain the same definition with the rapid rectilinear lens that one obtains with the Dynar at *f*/6, it is necessary to stop the rectilinear down to *f*/16, which would necessitate eight times the exposure required with the Dynar. Also the Dynar *f*/6 is twice as fast as the rectilinear working at *f*/8, apart from the fact that the rectilinear at *f*/8 cannot possibly produce the same sharpness of definition nor have the same covering power as the Dynar when used at its full aperture of *f*/6.

One of the most vitally interesting booklets I have seen in many moons comes to me from the Wollensak Optical Company, Rochester, N. Y. It is entitled Verito: "The Lens That Improves on Acquaintance," and is a 32-page booklet, profusely illustrated and wholly devoted to "Soft Focus Photography with the Verito Lens." The text is made up of articles and notes about the Verito by H. Oliver Bodine, Frank Scott Clark, D. J. Ruzicka, M. D., Ryland W. Phillips, John H. Garo, E. H. Weston, Prof. J. H. Scott, Walter Burke, Malcolm Dean Miller, M. D., Albert Kelly, Arthur Hammond, and others. There are twelve illustrations reproduced from Verito prints, printed on matt coated paper, and the booklet itself is printed on hand-made Japanese paper, in two colors, and tied with silk. I understand that this remarkable bit of book-making has cost the Wollensak Optical Company in the neighborhood of 20 cents per copy, so that its free distribution is necessarily limited. By writing at once and mentioning THE PHOTO-MINIATURE, any reader of this paper can obtain a copy. It is a thoroughly enjoyable bit of work, and the edition will doubtless be exhausted very quickly.

The comment made by Mr. K. L. Cottrell in the advertisement of the Defender Photo Supply Company, in this issue, scores a good point. The Defender papers, plates, films and chemicals have not been in the "experimental class" for a long time. Use Argo paper for your next lot of prints and you will approve Mr. Cottrell's suggestions as to "positive and negative statements."

Everyone who enjoyed reading the last number of THE PHOTO-MINIATURE on "Pocket-Camera Photography" should send to the International Photo Sales Corporation, 235 Fifth Avenue, New York, for a copy of the first Ipsco catalogue, which illustrates and describes some thirty-two models of German-made pocket cameras—the aristocracy of their line. The variety is wonderful, and the little book is full of interesting information. Mention this note when you write.

Burke & James, Inc., Chicago, in response to requests from many dealers, have equipped a new department for developing, printing and enlarging for the trade only. There is room for considerable improvement in the way many small dealers do developing and printing for their amateur customers, and it is to be hoped that this new departure by our friends, Burke & James, will give a decided uplift to the quality of the finishing done by the trade.

The Strauss Studio, of St. Louis, is justly celebrated for its many interesting exhibitions. The last announcement tells of a demonstration of the art of making etchings by Mr. Charles K. Gleason, a member of the Chicago Society of Etchers and an exhibitor at the Paris Salon for the last few years.

Mr. L. H. Jeffries, recently identified with a Milwaukee photo-supply house, has accepted the position of manager of the retail department of the Northern Photo Supply Co., Minneapolis, Minn. This is a gain to the Northern Photo Supply Co., and will materially strengthen the splendid service given by this house to its customers.

Photography is going to play a big and interesting part in the Panama-Pacific International Exposition, 1915, in San Francisco. All the most recent developments in color photography and scientific applications of the photographic process, including moving pictures, will be fully displayed in the Palace of Liberal Arts.

The department of photography is desirous of securing a thoroughly representative exhibition of photographic work. Class No. 124, one of the three classes into which the photographic group is divided, is to be devoted wholly to examples of pictorial photography. All photographic societies and individual pictorial workers are urged to communicate with Mr. Theodore Hardee, Chief of Liberal Arts Department, care of The Exposition. Blanks for exhibit space and information will be forwarded on request.

At a meeting held on June 7th, the temporary organization of the Cleveland, Ohio, Camera Club was effected. The purpose of the club is to provide a meeting-place for those interested in photography, where all facilities for developing, printing, enlarging, and copying will be available at all hours, every day of the week. A series of exhibitions and demonstrations is also being arranged for. Amateurs of Cleveland and vicinity are invited to communicate with the Secretary-Treasurer, Mr. A. C. Williams, P. O. Box 102, Cleveland, Ohio.

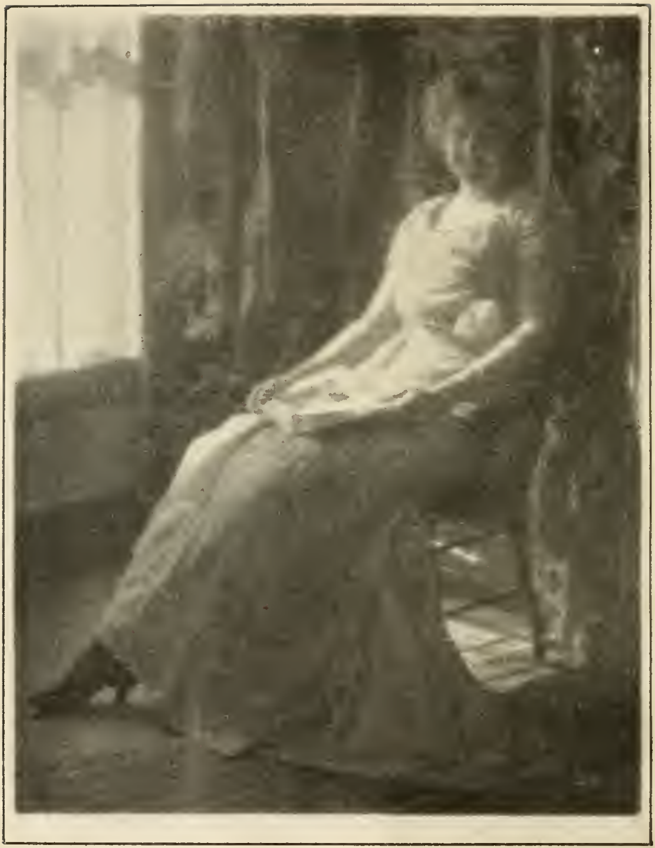
A booklet giving full instructions for the use of Dufay Dioptichrome plates for photographing in colors reaches us from the American Agent, George Murphy, Inc., 57 East 9th Street, New York. Dufay plates are simple in manipulation and give pictures with great brilliancy of coloring.

A series of illustrated booklets written and illustrated by Mr. and Mrs. H. Snowden Ward, for the North Eastern Railway Company of England, has been completed by the addition of four or five delightful little books dealing with (1) England's Playground; (2) Northumbria's Romantic Border Land; (3) Old Barnard Castle; (4) York, the Minster City; (5) Ripon and Fountains Abbey; (6) Hexham and the Roman Wall; (7) Beverly and Howden (in Yorkshire); and (8) Durham—Half Church of God, Half Castle 'gainst the Scot. These booklets deal with the familiar scenes of my boyhood, and it is a great pleasure to read their praises written by my old friend, H. Snowden Ward, and to see their beauty so charmingly portrayed by Mrs. Ward. Readers who are going to England this summer should spare a week and see these lovely little towns in the Playground of England, after reading the series mentioned above, which may be obtained on application to the Passenger Manager, Northeastern Railway, York, England.

Those who think or find it too bothersome to put backgrounds into their portrait negatives, according to the methods given in this number, should write to H. P. Barnes, La Porte, Ind., asking for his illustrated sheet of Auto Print-in Background Films. These print-in films save a lot of work and are all that is claimed for them. See what Mr, Barnes says in his advertisement in this issue and get in touch with him.

Among press photographers, bromide paper is very generally used when there is question of making an enlargement from a small negative. Montauk bromide paper, made in nine grades and surfaces (G. Gennert, New York), is widely used among press workers; Grade No. 4, Press Bromide, meeting the requirements of this class of work in all particulars. Users of bromide paper should send to the manufacturer for his circular describing Press Bromide.

"Useful Tables for the Photographer," a collection of tables of diaphragm numbers, distances of lens to subject for giving images of different sizes, reducing and enlarging tables, view angles, lens facts, shutter speeds, etc., is a very compact little booklet of valuable information which the Bausch & Lomb Optical Company, Rochester, will gladly send to anyone on request. It deserves a wide circulation.



Portrait
By Paul L. Anderson

The Photo-Miniature

A Magazine of Photographic Information

EDITED BY JOHN A. TENNANT

Volume XI   JUNE, 1913   Number 127

Amateur Portraiture

After six years of enthusiastic study and experience in the field of home portraiture, I have, very naturally, accumulated a few definite opinions about the methods which make for success in this particular field of camera work. One of these opinions must, in fairness to the reader, be mentioned here in the forefront of this monograph. It is—that every worker in home portraiture must find the way to success for himself! Other workers' methods will often be suggestive and helpful; but rarely will they be immediately applicable in practice without much modification. This may read somewhat discouraging, but I believe it to be true. In all portraiture success depends upon one's treatment of the subject, and the handling of local conditions so that they will aid in the single purpose of getting a pleasing portrait of the person photographed. This demands, not merely a sufficient knowledge of the technical processes of exposure, development and printing, but chiefly the exercise of all sorts of personal qualities which have to do with obtaining a characteristic likeness, the lighting of the subject and a happy arrangement or composition of subject and surroundings. With the local conditions changing all the time, the making of every home portrait presents its own peculiar problems, and the only successful method is that evolved by the worker to fit the conditions of each individual case.

For this reason, I would make it plain that in these pages I am giving only those methods which my own experience has shown me to be best adapted to produce the results I desire. Many of them are radically opposed to other methods given in the accounts detailed in other books by other workers in the same field. I cannot help this opposition. Different workers are bound to evolve different methods. Therefore I can only hope that the reader will follow the advice here given in a questioning spirit, experimenting with various methods for himself as he goes along, altering, adapting and improving as the occasion may require.

I have written for all amateurs, using the word in its broadest sense of "lovers," which will include many professional portraitists, who are as much in love with their profession as some amateurs are with their hobby. It is now three years since I entered the professional ranks, but I still retain all the enthusiasm which inspired me as an amateur, and I feel that this must be the motive power for anyone who hopes to do good and lasting work in portraiture.

It is assumed throughout that the work is to be done in the home of the sitter or subject, and not in the regular or in any makeshift studio. Only in this way can the portrait have the quality of naturalness which is the chief charm of home portraiture. This can rarely be attained in a studio or in any room fitted up to simulate one. In the home the problem is far more interesting, conditions never being twice alike, but presenting always new questions to be answered, new technical propositions to be solved, and new difficulties to be met. Add to all this that even the most self-possessed of persons feels more at home when, precisely, at home, and is therefore freer from self-consciousness than in unaccustomed surroundings, and it will be seen that the advantages of working in this fashion must far outweigh the facility that comes from known conditions of light and accessories. With children, it is almost impossible to work satisfactorily except in their homes.

Apparatus

The camera may be of any type, even the folding hand camera being useful in the hands of one acquainted with it. It may seem strange to say "even a folding hand camera," when the manufacturers of these instruments insist so strongly on their unlimited usefulness; but my experience has been that, if anything more than the casual snapshot is desired, the folding hand camera is the most difficult of all to handle, and should be adopted only by those who have had considerable experience in the use of a focusing screen. If such an instrument is to be used, it should be fitted with the largest possible direct view-finder, and the focusing scale should be extended, which may be done in the following manner: The camera is set up and the bellows drawn out as far as possible, the back is removed, and a ground glass is placed with the ground side in contact with the rollers over which the film travels. A small, bright object—a candle flame is excellent—is then moved back and forth until it is accurately in focus, when the distance of the object from the lens is carefully measured, and a scratch is made on the base-board opposite the pointer. Thus, my own 4A Kodak has been extended to permit of focusing at four feet, the minimum distance originally indicated being six feet, and this means a considerable increase in the size of the image. A similar adjustment is, of course, possible with any focusing hand camera. This adjustment is, to my mind, much more desirable than the use of the much-advertised portrait attachments. These shorten the focus of the lens, often already too short to give correct drawing, and are apt to give distortion.

The Reflecting Camera

A reflecting hand camera, such as the new "Home Portrait" Graflex, or any similar camera of this class, is very useful in amateur portraiture, especially where one has to follow the subject—as in photographing children or in working out-of-doors about the home. The reflecting mirror gives one complete control of the composition of the subject as well as the focusing, and these, in the case of restless subjects, are big advantages.

Personal Preference

Personally, I feel that the best camera for general home portrait work is one of the well-known view type, having a long bellows with slight taper, thus permitting the use of long-focus lenses of comparatively large aperture. Such instruments ordinarily have more adjustments than the hand cameras, though they are not so compact as, and lack the convenience of the latter. On the other hand, they are cheaper, and are made in larger sizes, the largest size which the worker can handle being the one to choose. A large print is undeniably more impressive than a small one, while, if it is desired to use small plates, this can easily be done by means of kits in the holders. Some workers prefer to use a small camera and obtain large prints by enlarging, but this, if carbon, platinum, or gum prints are wanted, means that a large negative must be made, and it is by no means easy to hold the desired quality through the two operations of making a transparency and from that an enlarged negative. I myself find an 8 x 10 camera, which, with tripod and a dozen plates, weighs not far from forty pounds, to be about all that I wish to carry for a day.

The value of the focusing screen cannot be over-estimated, permitting, as it does, the arrangement of the picture on the ground glass, and making possible the suppression of accessories and the emphasis of special planes by focal adjustments, something that is difficult to attain with a camera so constructed that the focusing is a matter of estimation. The worker should, of course, familiarize himself thoroughly with all the adjustments of his instrument, so that their use is automatic and requires no thought; thus leaving the mind free to concentrate on other matters, whereof there will be enough to occupy his attention.

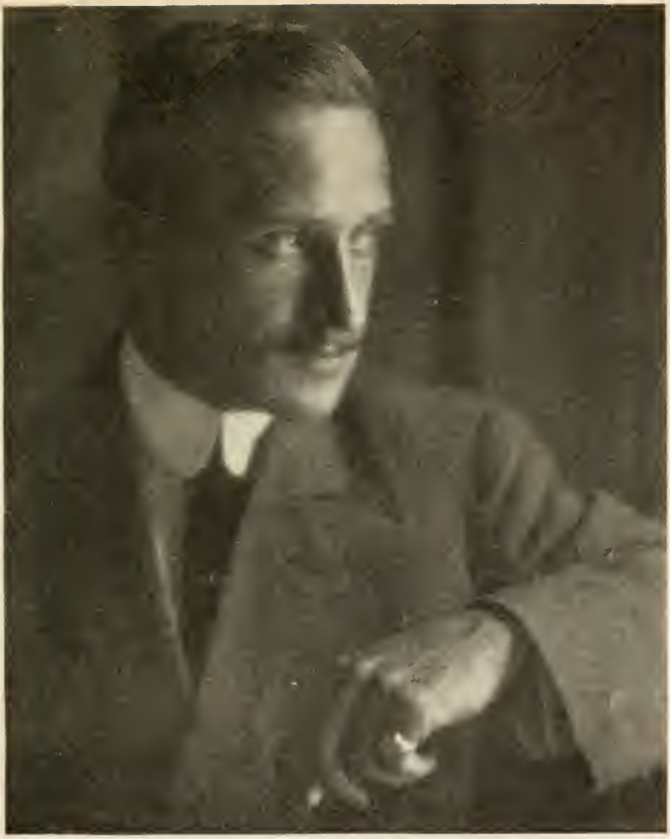
A Tripod Point

The tripod should be substantial and should be provided with corks on the points, partly because a slip may result in damage to the apparatus, and partly because it is difficult to call up a pleasant expression on the face of a housewife who has just seen a tripod point make a deep scratch on her polished oak floor.

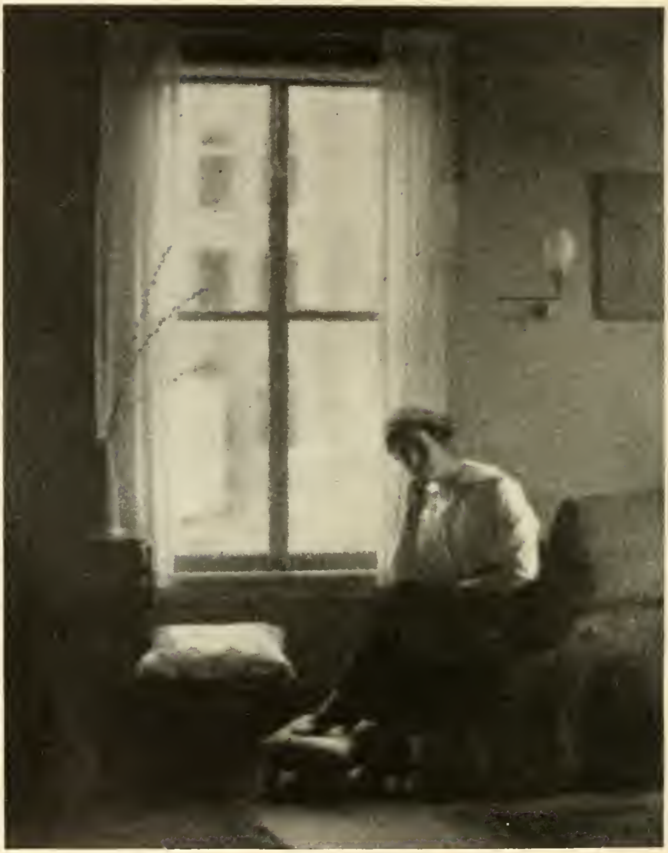
Lenses

The choice of a lens is probably the most debated question in the whole realm of pictorial photography, and reminds one of Kipling's lines:

> "There are nine-and-forty ways
> Of constructing tribal lays,
> And every single one of them is right."



An unusual lighting, giving character, modeling and relief
By Paul L. Anderson



Window effect, against the light
By Paul L. Anderson

There are probably more than nine-and-forty makes of lenses on the market, and each of them is good for its own particular purpose. The bother is that so many do not seem to ask themselves whether the lens in use or available is the one best adapted for the work in hand.

The Anastigmat

Just now the anastigmat is the prevailing fashion. It has the big advantages of speed and a flat field, and these two qualities play an important part in producing just the sort of portraits preferred by a majority of those for whom the amateur will most often attempt portraiture. In many instances, indeed, where the light conditions are difficult, the speed of the anastigmat is essential to success. But, in spite of these things, I cannot recommend the anastigmat, except where the conditions demand it. It is apt to give an unpleasantly sharp, wiry definition to the picture image, which happens to be the very quality I try to avoid in my work. And the anastigmat is an expensive luxury. Of course, if the reader has an anastigmat, by all means let him use it, and learn how to make it give him the effects desired. There *are* ways of getting the most desirable quality of definition with the anastigmat, as the portraits of many professionals have proved. I have seen such portraits, made with the best of our modern anastigmats, soft and yet sparkling, plastic and splendidly modeled. It is perhaps a detail for personal preference, and I prefer the definition of the less expensive and less perfectly corrected rapid rectilinear or single achromatic lens, working at $f/8$.

Softening Definition

An excellent method for softening the definition of an anastigmat has, however, been suggested to me by Messrs. Davenport and Lester, of the Orange Camera Club, and is as follows: A lens cap of such size as to fit snugly over the back of the lens is obtained, and in it is cut a circular opening slightly larger than the rear element of the objective. Over this opening are stretched two or more thicknesses of chiffon, preferably white, which are fastened in place with some strong adhesive. After focusing, the lens-board is lifted out and the cap with the chiffon is placed on the rear of the lens—if it is put in front the plate will probably be fogged—and the exposure is made, two thicknesses of chiffon requiring about fifty per cent increase of time over that necessary with the unscreened lens, according to my experiments, though Messrs. Davenport and Lester state that no increase of exposure is required. By this means a very pleasing quality of definition is obtained, and at the same time the advantages of the anastigmat, speed and flatness of field, are in great measure kept.

Soft-Focus Lenses

The use of soft-focus lenses for portraiture is growing in popularity, apparently an unconscious protest against the sharp definition of the anastigmat referred to above. In capable hands these soft-focus lenses give very pleasing results, and many well-known portrait workers are enthusiastic over the qualities they obtain by their use. The Wollensak Optical Co., Pinkham & Smith, and the Spencer Lens Co., have introduced lenses of this class, working at apertures varying from *f*/4.5 to *f*/7.5. The Taylor, Hobson Co. has a similar lens, the Cooke Achromatic Portrait Lens, which gives a softly rounded and well-modelled portrait. To my mind, these soft-focus lenses are admirable for large heads and figure portraiture in the larger sizes, the definition being a trifle too soft for small work. Among the illustrations may be seen an excellent example of the work of the Wollensak Verito, published by the courtesy of the Wollensak Optical Co., which shows what this lens is capable of when capably handled. The Verito Book, recently published by this firm, contains many other examples and much information on soft-focus work, which will help the amateur or professional who desires to try out the pictorial possibilities of this class of lenses.

About Focal Length

One characteristic which the lens should unquestionably have is an adequate focal length. This has been dinned into the ears of photographers by the magazines for a long time. It is commonly stated that "a long-focus lens gives better perspective or drawing than a short-focus one," but this is not a correct exposition of the facts, for a short-focus lens gives the same drawing as a long-focus, if used at the same distance from the sitter, and all that the longer lens does is to force the camera further from the sitter, in order to get a certain size of image. Or, to put it differently, at a given distance the longer-focus lens will give a larger image than the lens of shorter focus. We cannot here go into the reason for this state of affairs, but the reader can find a complete explanation in any good text-book on lenses, and we may be content with the assertion that the lens should have a focal length not less than the sum of two adjacent sides of the plate on which it is to be used, That is, for an 8 x 10 plate the lens should have at least 18 inches equivalent focus, while, if conditions will permit, this should preferably be increased by at least fifty per cent, that is, to 27 inches, though this last size would probably confine the photographer to busts and large heads when working in the rooms of the ordinary house.

Exposure Shutters

An exposure shutter is by no means necessary, for, until the past year, practically all of my own work was done with a cap, as much of it still is. However, a shutter is convenient, especially when working with children, and the best that I know of is the diaphragm studio shutter of the Wollensak Optical Company, which has a maximum speed of about one-eighth second—this being as fast as will be required—is practically silent, and is more reliable than most studio shutters. For small lenses there are many types of shutter available. A good one—which generally means a high-priced one—is very useful, for in many cases the exposure will be one second or less, and the shutter will give it automatically, thus relieving the photographer of one more thing to think of. The Koilos, Compound, and Optimo are all to be recommended, and there are other good ones.

Plates

The choice of a plate is another thing much debated in the photographic world, but here we may be somewhat more positive than in the matter of a lens. In the first place, the ordinary—non-orthochromatic—plate has no place in portraiture. It is, in general, dangerous to assert a negative, but I believe it safe to say that there is no condition ever arising in portrait work such that the orthochromatic plate is not far preferable to the blue-sensitive one. Of course, this does not hold true in landscape work, but we are not discussing that branch at present, and in portraiture the orthochromatic plate will do all that the ordinary one will do, and much more. It will be apparent that a plate which represents red and yellow as black cannot give correct values to the face, and must accentuate the visual results of what Herbert Spencer euphemistically calls "defects of visceral constitution," besides rendering the planes falsely, thus necessitating much retouching to compensate both faults. If the work is done outdoors, the difference is still more noticeable; for the ordinary plate flattens sunlight most distressingly, and many of the best effects are those including direct sunshine.

Some workers advocate the use of panchromatic plates; but these must be developed in total darkness or by the aid of a dim green light, so that the photographer cannot modify the development so readily as with the orthochromatic type. However, the panchromatic plate is so far superior to any other in rendering color values that I would use it for all my portrait work were it not that I do not know of any made with a double coating. There are excellent panchromatic plates on the market, with speed sufficient for any purpose, and they are furnished backed, thus preventing halation; but the double-coated plate will hold up values in the lights when a single-coated plate will fail to do so, no matter how non-halation it is, and much of my work is done against the light, so that I have never found any other type of plate to give the satisfaction that a double-coated orthochromatic will give. Be it said, however, that I am only waiting for someone to bring out a reasonably fast double-coated panchromatic plate in order to adopt it for all my portrait work. For small portraits, such as are made with the ordinary hand camera on a stand, the standard roll films and film pack have sufficient ortho quality to give pleasing values.

A Filter Essential

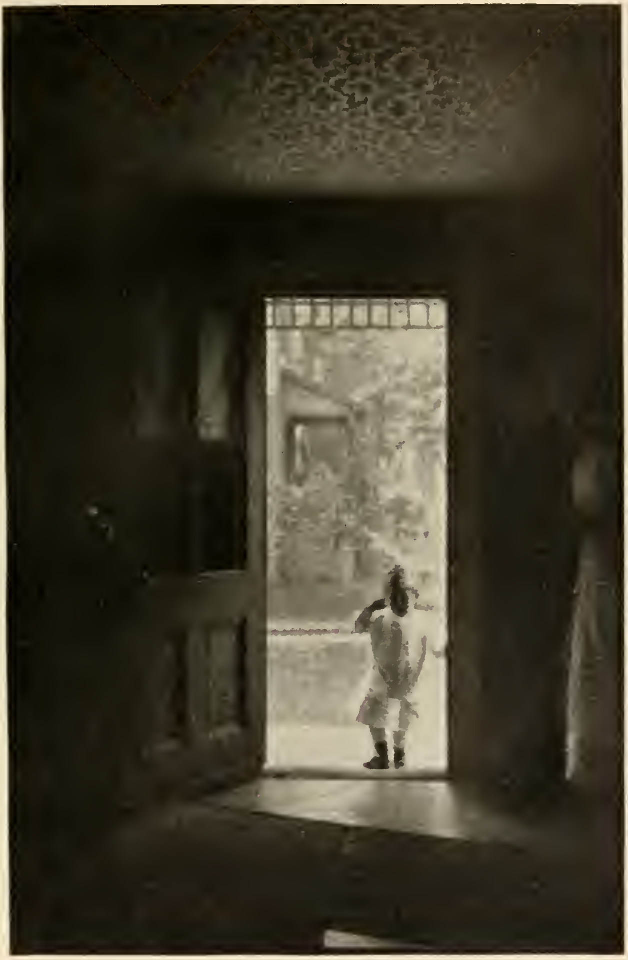
The orthochromatic plate must be used with a suitable color filter if it is to show any marked advantage over the ordinary type; and the word "suitable" is employed advisedly, for many photographers seem to have the idea that any color filter will give correct values with any orthochromatic plate. This is so far from being the case that the rendering with the filter may be even worse than without, and the filter should be adjusted to the plate and purchased from the makers of the plate to be used. Failing this, an approximate idea of the correction may be obtained by exposing a plate through the filter, using a color chart as subject. After development, a print is made from the negative, and the values are compared with those of the chart. The G. Cramer Dry Plate Company, and Wratten and Wainwright—whose products are obtainable in this country from the Eastman Kodak Company, the Seed D. P. Co., the Paget Co.—furnish filters adjusted to their plates, and perhaps other firms do the same.

Exposures With Filters

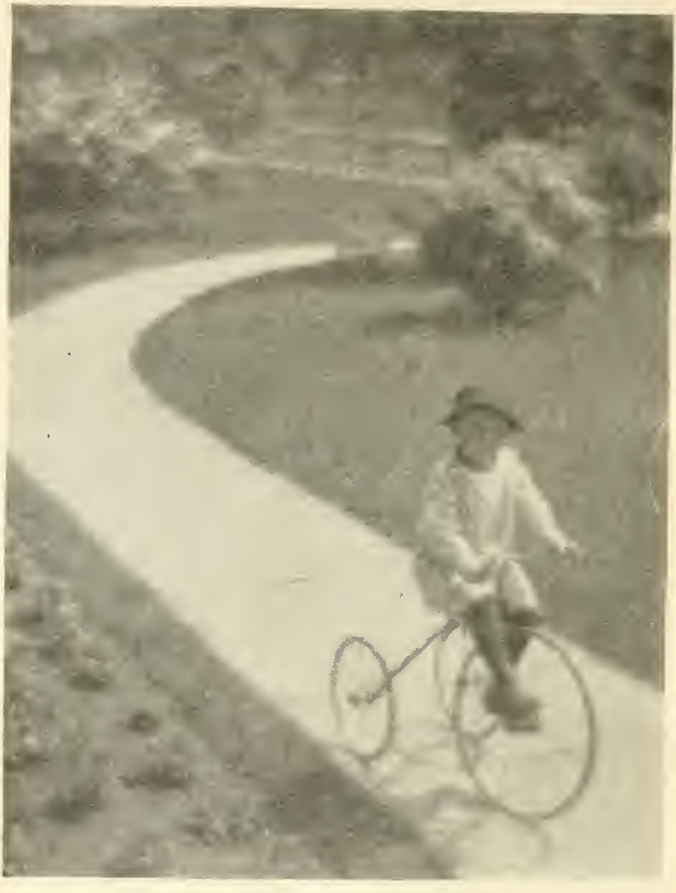
It may be objected that the use of a filter prolongs the exposure so much as to make it unavailable indoors, but I have not found this to be the case, except with young children, when the briefest possible exposure is often too long to arrest motion. The Isos filters of the G. Cramer Dry Plate Company give good correction, as do those of Wratten and Wainwright, the No. III of the former firm and the K2 of the latter giving values as nearly correct as can be got without the use of a panchromatic plate, and requiring only five times and three times, respectively, the exposure necessary for an unscreened plate. This means that indoor exposures will range from two and one-half to twenty seconds, in ordinary circumstances, using the screen; and if the photographer is expert enough to work without superflous haste or excitement, and quietly, and can interest the sitter in some topic of conversation, he will generally find no difficulty in holding a pose for the required time, though in the case of a neurotic person it may be hard to accomplish. With very young children it may be necessary either to discard the filter or to go outdoors, the latter resort being preferable; for the correction of values is so desirable that it should be considered of the utmost importance, and should not be lost if it is in any way possible to retain it. The K3 filter of Wratten and Wainwright is used with their panchromatic plate, and has a multiplying factor of about four and one-half or five, the exact factor being given with each batch of emulsion—a custom which should be adopted by every plate manufacturer, and the plate itself is about fifty per cent faster than the ordinary orthochromatic plate, so that with this combination the exposures will run from two to fifteen seconds, being slightly less than with the outfit mentioned above, of the Cramer company. The Imperial Non-Filter plate is a good plate for use where a filter is impracticable.

Determining Exposures Some means of determining the correct exposure must be adopted, at all events until the worker has had a great deal of experience, and there are three methods available. The first depends on the rapidity with which a piece of sensitive paper darkens on exposure to light, and is made use of in the Wynne and Watkins actinometers, which furnish a standard tint for comparison with the darkening paper. The second method is to employ a set of tables calculated from experiment with various plates in different circumstances, and the most convenient of the many which I have tried is that put out by Burroughs Wellcome & Co.; though I cannot say that this has any advantage over others so far as accuracy is concerned. The third method depends on the fact that the visibility of shadow detail decreases as one looks through an aperture smaller than the pupil of the eye, or as varying thicknesses of some semi-transparent substance are interposed between the eye and the object regarded, this method being employed in the Heyde actinometer, which many amateurs use with a great deal of satisfaction. Of the other two types, either may be used with satisfaction, each having its advantages and disadvantages.

The actinometers of Wynne and Watkins take some time to use, especially in a weak light, and require that the user be able to judge correctly the relationship of two tints; something that is not always easy to do until one has had some experience. Also, they seem to indicate, in a weak light such as that of indoors, more exposure than is actually necessary. For instance, I recently developed some plates, and found them fully exposed, even



Doorway effect, suitable for children's portraits
By Paul L. Anderson



Sunlight—out-of-doors
By Paul L. Anderson

to the deepest shadows, the subject being a portrait taken on a porch, the plates having had one-eighth second exposure, while a Wynne actinometer, used with every precaution against error, called for three-eighths second. Of course, it is almost always well to be on the safe side and give more time than the minimum required, for the modern plate has considerable latitude on the over side; but it will often happen, in working with children, that one-eighth second will be possible, while three-eighths will mean failure. Now, while the Burroughs Wellcome tables indicated this exposure correctly—that is, showed the minimum allowable time—it would have been found, had I gone indoors, that the indications by the latter method for the new conditions would, if followed exactly, have given under-exposure.

On the whole, the best advice that can be given to the beginner is that he provide himself with an actinometer of the Wynne, Watkins or Heyde type and a copy of the Burroughs Wellcome tables, using them carefully in different circumstances, noting the readings in a memorandum book and exposing plates in accordance with these readings. On development, it will appear whether the plates were over- or under-exposed, and by a few experiments of this sort the photographer will gain a knowledge of the allowance to be made with each form of calculator, none being automatic, but each requiring the use of judgment. After he has been working for some time, he will find that he is gaining the ability to estimate the exposure with a reasonable degree of accuracy without using the meters, and to this end he should make a practice of estimating every exposure before referring to his aids, either from the general appearance of the subject or from the illumination of the image on the ground glass.

Development

For a clear comprehension of this much misunderstood phenomenon the worker is referred to THE PHOTO MINIATURE, No. 66: "Practical Methods of Development," now out of print, but to be found in the libraries of most camera clubs, and perhaps obtainable from some dealers. A full discussion of the matter would occupy more space than can be afforded here, but the fundamental principles may be stated briefly as follows, the two lines condensing some hours' reading.

> ''Relative contrast is a function of exposure.''
> ''Actual contrast is a function of development.''

This means simply that the actual distance between two gradations may be increased by prolonging development, but the relative separation of these gradations is permanently fixed by exposure, under-exposure giving relatively flat shadows and over-exposure relatively flat lights; though the latter state of affairs is seldom noticed with double-coated plates. There is one exception to these laws, in that a weak developer will give relatively flat lights; this being due to the fact that the developer which is deep in the film is not so readily replaced by fresh as that on the surface of the plate, and becomes exhausted before that which is working on the surface of the film, where lie the shadow details. Hence, to get a soft result, or in the case of an under-exposed plate, a weak developer should be used. Incidentally, in the latter event, warming the developer—up to 80° Fahr. or thereabout—will often prove very helpful.

A fact which is apparently opposed to the claims of the manufacturers is that, so far as ultimate results are concerned, it makes absolutely no difference what reducing agent is employed, the detail-giving and density-giving powers of all the organic developers being identieal, if properly used, and the only choice being a matter of convenience. In home portraiture the desire generally is to get a soft negative with full detail, and one of the long-factor developers should be chosen, such as citol (or rodinal, these being different trade names for the same product), rytol, metol, edinol, or pyro-acetone. An exception to the above general rule is eikonogen, which is a short-factor developer but gives soft negatives.

Formulæ for Tray Development

The following formulæ are offered as the result of my own experiments so far as their application to this work is con-concerned, and are calculated to give soft rather than strong negatives, though they may need modification for some plates. Each separate formula here is distinguished by a Roman figure. In developers made up of two or more solutions, these are indicated by the letters A, B, C, etc.

I. Citol (or rodinal), 1 part; water, 30 parts. **II.** Rytol, 1 pair of products; water, 6 to 8 ounces. **III.** Potassium metabisulphite, 300 grains; sodium carbonate (anhydrous), 800 grains. Mix thoroughly and dissolve in water (distilled), 14 ounces. Add and dissolve edinol, 300 grains. This forms a concentrated stock solution which keeps well. For use, take stock solution, 1 part; and add water, 20 parts. **IV.** (A) Water (distilled), 30 ounces; sodium sulphite (anhydrous), 480 grains; eikonogen, 240 grains. (B) Water (distilled), 30 ounces; sodium carbonate (anhydrous), 360 grains. For use, take (A), 1 part; (B), 1 part; water, 1 part. This keeps well, and the used developer may be employed repeatedly until exhausted. **V.** Water (warm, distilled), 16 ounces; metol, 96 grains; hydroquinone, 384 grains. When dissolved, add sodium sulphite (anhydrous), 1,440 grains. A thick precipitate results. Add caustic soda (pure stick), 256 grains, and stir. A clear solution results, and is filtered into a bottle, forming a concentrated stock solution which keeps well. For use, take stock solution, 1 part; water, 30 parts.

Tank Development

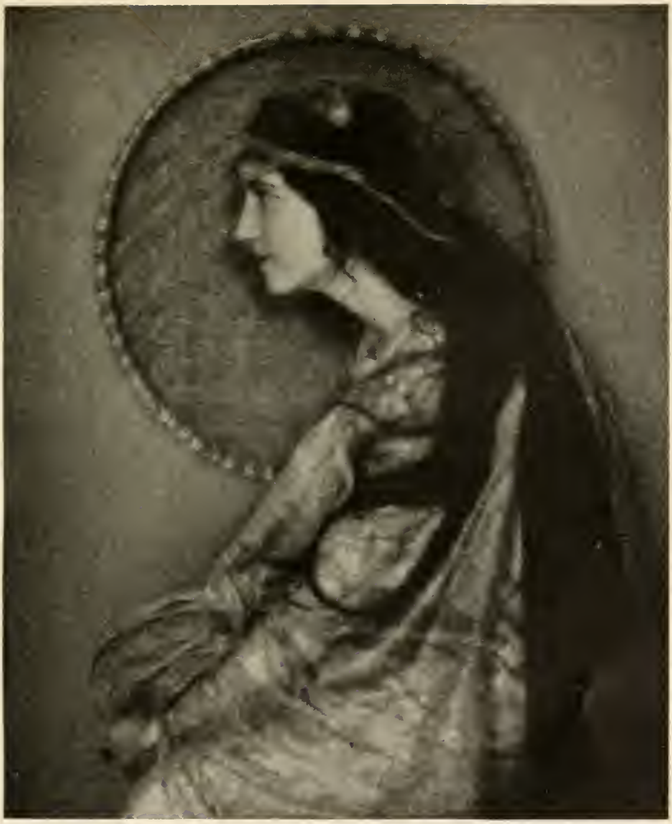
These formulæ are for tray development, and, if the photographer wishes to use tank development, he should procure from the various manufacturers copies of their leaflets on tank development with rodinal, citol, metol, etc., wherein are given times and strength of solution for practically all the well-known plates and films. Tank development, however, is not advised unless it is desired to obtain a number of similar negatives from a set of exposures, something which I myself rarely wish to do. If, however, uniformity of negative quality is desired, the tank is the most rapid, safe, and convenient method possible, as well as the most accurate, and it is always to be recommended with panchromatic plates. In fact, I would prefer to develop these in a tank and modify the negatives by intensification, reduction, or in printing, rather than run the risks involved in developing them in a tray. Factorial development is not advised unless it is known that the exposures were nearly correct, as it tends to shorten the development of an over-exposed, and prolong the development of an under-exposed, plate, which is just the reverse of the proper treatment. Where the exposure is approximately correct, it is a very convenient method of working. Personally, I keep only citol and rytol (citol is somewhat cheaper than rodinal), both being very convenient; the former being a concentrated stock, requiring only dilution with water, the second being in the form of tablets, to be dissolved in a given quantity of water. Citol is used when a very soft negative is wanted or when the exposure has verged on the minimum; rytol when a stronger negative is desired, or when the exposure has been full or excessive.

Backgrounds, Reflectors, and Accessories

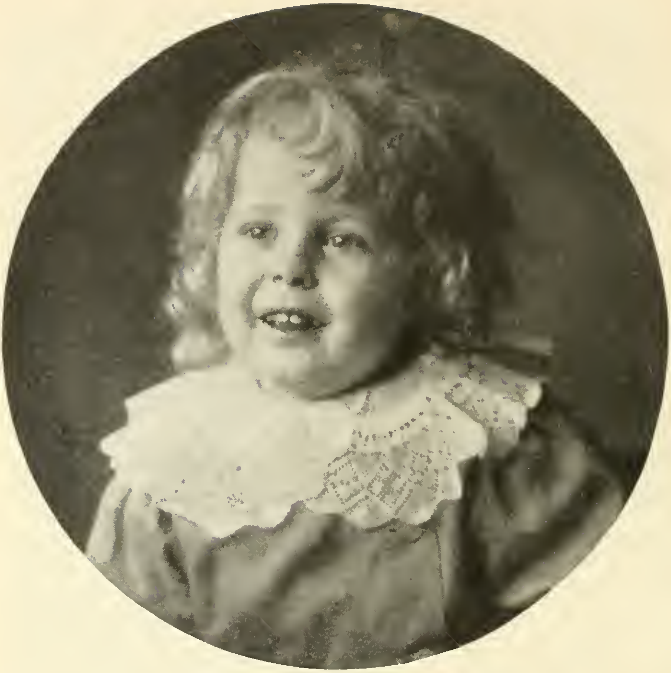
It should be the aim of every photographer to produce portraits which suggest the sitter—at his best, of course—as strongly as possible; though some professionals seem to forget this, and for this reason the lighting, background, and accessories should be those found in the sitter's daily life. It will be apparent that the curtaining of a window to produce the conventional 45 degrees lighting of the studio cannot but result in a false effect, for one is so seldom seen with the face lighted at this angle that few would recognize it as a possible arrangement.

Some writers claim that it is impossible to give a feeling of roundness and plasticity to a face except by this means, and draw diagrams of spheres lighted at various angles in order to uphold their contention; but I do not hesitate to assert positively that this is not so, and that if the lens and plate be properly handled the flattest front lighting possible may be made to give perfect modeling and roundness. [This would seem to run contrary to the experience of portraitists time out of memory, who have asserted that lighting the face from the 45° angle best brings out the characteristics of the person.—EDITOR.]

I would suggest that the best way to disprove the inaccurate statement quoted above is for the photographer to take his camera and do the thing which is said



''Soft-focus'' portrait. Made with the Wollensak Verito lens F:4.5
By Jack Rivers



''Soft-focus' portrait, made in 1903
By Fred Radford

to be impossible, and I can assure him that he will find it no difficult task. It follows, of course, that reflectors should be avoided, for they also will operate to produce a false effect, though this must not be construed as deprecating the use of a book, a newspaper, or a white dress, to produce an odd and striking effect, provided that the origin of the reflected light is apparent—not necessarily visible. In fact, a well-known critic once said to me: "I feel that art, to be of any value, must contain a certain element of surprise." This, on the other hand, must not be regarded as justification for indulging in the melodramatic, as is done by some photographers, who represent a perfectly ordinary twentieth-century personage in the guise of a hero of romance.

Obviously, all painted backgrounds, from the simple clouded ground so often sold in portable form for home portraiture to the elaborate scenic affair, should be discarded also, for they tend to detract from the natural quality of the result. An extreme instance of this was the case of a print seen in the show-case of a professional of some reputation, who had posed a young girl with her back to a drop painted to resemble a window, and had lighted her face at the usual angle of 45 degrees *from the front*. A plain cartridge paper on the wall makes a pleasing background, the necessary relief and feeling of air behind the figure being got by posing the sitter at such a distance from the wall that the cast shadow serves the purpose, with perhaps a small picture on the wall to complete the composition. A window, too, is often suitable, as is a figured wall-paper of quiet design. A door-way into a darker room may frequently be used, and, in fact, the possibilities are endless, arrangements suggesting themselves at every turn.

Accessories should, of course, be such as the sitter is commonly associated with, and should be few in number, quiet in value, of simple character, and, in general, as non-assertive as possible, the chief thoughts throughout being naturalness, harmony and reserve.

Lighting

So far as lighting is concerned, this depends so completely on the character of the sitter's face and the result desired that the only advice which can be given to the photographer is that he use his eyes. It may at times be necessary to curtain a window by pinning up cloths so as to get a small area of concentrated light, or to raise the shade fully so as to obtain a full, diffused, illumination; and the best exposition I have ever seen is attributed to Frank Eugene, whose magnificent portraits are familiar to readers of "Camera Work." Someone was interviewing well-known professionals to learn their methods of work, and asked Eugene what form of light he preferred. Eugene replied: "I work anywhere, in a drawing-room, a bedroom, a butler's pantry, even in a bathroom. The usual studio, with its 45° slant light, I regard as a famous place for propagating tropical plants, but for no other purpose." It may be that this incident never took place, but if it didn't, it should have done so, for it expresses perfectly the attitude of the free-minded man of original thought toward the hampering conditions that photographers so often insist on burdening themselves with.

Study

Portrait work is probably the most difficult branch of pictorial art, whether for the photographer or the painter, and demands much careful study if results of value are to be attained. The portraitist who uses a camera must be so skilled in his work that technique is automatic and does not require thought. He must have studied until his senses react unconsciously to a pleasing or an unpleasing arrangement, and he must be equally sensitive to values. Furthermore, he must be at least a practical psychologist, that he may recognize instantly a pose and expression which are characteristic of the sitter, and he must be able to put the sitter at ease, so as to call forth the desired expression. He must also know what lighting and arrangement will accentuate the characteristics to be expressed, and must be able to carry out his intentions without the sitter's perceiving them. This is a formidable list of requirements, but should not operate to discourage the reader, for they are attainable to some degree by everyone who cares to make the effort, and to a perfect degree by no one, not even the greatest portrait painter who ever lived having been thoroughly satisfied with his own knowledge.

About Technique

For the technique of photography the worker should study the various magazines, especially those devoted to the amateur, the professional portraitist generally having ideals of a totally different character from those of the amateur, the former being devoted to making money, the latter to making pictures. I have never found any text-book that could compare with the indexed files of THE PHOTO-MINIATURE, "American Photography," "The Camera," "Camera Craft" and "Photo Era." After all, however, nothing but practice can give the necessary command of technique, and the photographer must work as well as study. For the study of composition no worker, whether photographer, painter, or etcher, whether landscape or portrait worker, can find any text-book superior to "Pictorial Composition," by Henry R. Poore. In this book the principles of composition are discussed in a manner at once scholarly and scientific, and are explained fully, and at the same time so lucidly and so definitely as to be readily comprehensible and none the less impressive. In short, Mr. Poore's book should be studied by every artist until it has been so absorbed that the principles are applied unconsciously, as much without voluntary effort as the act of walking; for, if the composition of a picture is faulty, the whole will fail even though everything else about it be right. Some writers claim that composition should not be the result of study, but should take its rise in the artist's mind, originating with him, and that rules are made for the mediocre. This is largely true, but it should be noted that the book referred to above deals, not with *rules*, but with *principles*, which is a very different matter. Other books which will prove of value are THE PHOTO MINIATURE, Nos. 64, 95, and 109, covering "Figure Composition," "Essentials in Portraiture," and "Draperies and Accessories."

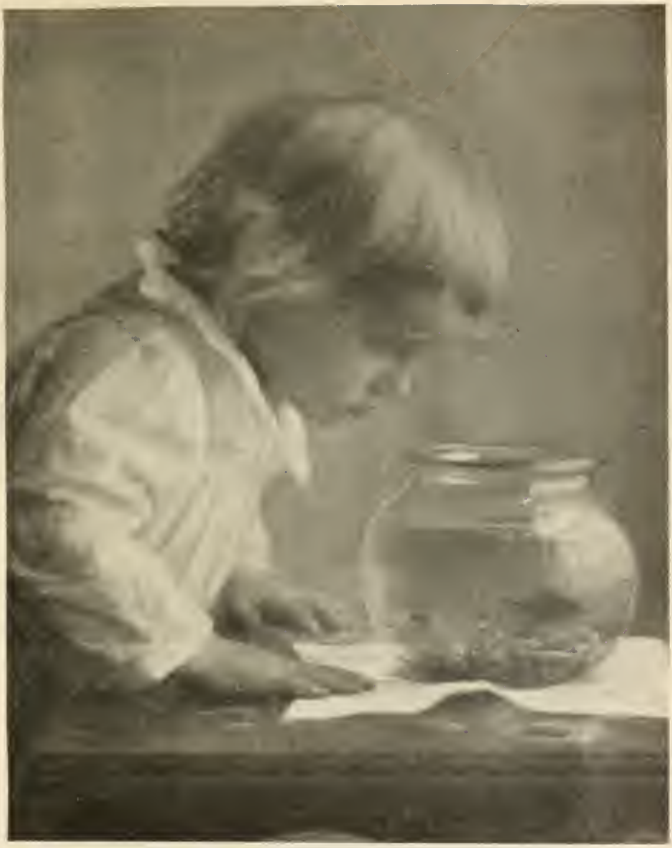
"Values"

I do not know of any book which treats the subject of values adequately, and would advise that the student resort to the use of a faculty which he must in any case cultivate—that of seeing. Few people see things, even those with which they are most familiar, and the portrait worker must learn to do so. If the reader thinks he sees, let him call to mind a dozen of his acquaintances and tell the color of each one's eyes. If he can do it correctly, he is an exceptionally observant person, and may further test his powers of observation by stating off-hand the color of the shadow of an opaque object cast by a Welsbach burner on a sheet of yellow paper. If he can do this correctly, he needs no suggestions as to the desirability of observing. So, in studying the objective phase of values, the reader should form the habit of looking at everything he sees with this in mind, observing not only the values of the object itself, but its relationship with surrounding things as well. Of course, the influence of color must be disregarded, and it is well to carry a black mirror, which will reduce everything viewed to monochrome.

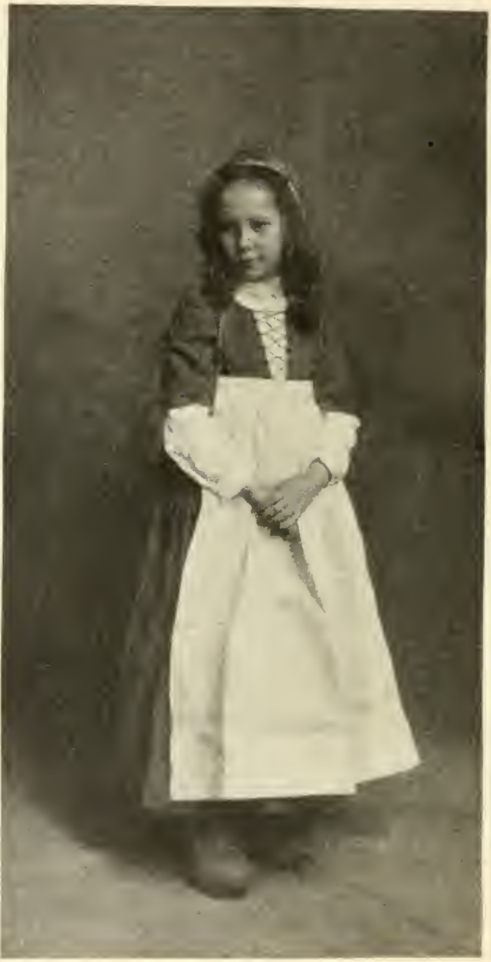
The subjective side of values can best be studied in the works of such photographers as Clarence White, Gertrude Käsebier, Heinrich Kühn, Craig Annan, and others of that class, preferably in the originals, at exhibitions; or, failing that, in the best reproductions obtainable. Also, the works of painters should be studied, especially those of Dewing, Tarbell, and Benson, and a useful plan is to make rough sketches in black and white—they need not be accurate in outline—showing the distribution of light and shade. It will be apparent after slight study that values may be exaggerated for pictorial effect, and, after a little more study, it will be seen that this is a dangerous thing to do, and must be carried out with judgment and care if a melodramatic effect is to be avoided.

Experiment and Study

The effect of lighting and pose and their relation to the expression of character are best studied by persuading someone to pose while the worker varies the light in intensity, area, and distance from the face as well as in the angle of incidence. It is sometimes advised that this study be carried out with a plaster cast; but this is not desirable, for the color of plaster is so different from that of the face that the results are misleading, and a plaster cast does not readily assume different expressions. Therefore, use the real person, and as many different



Portrait
By C. F. Clarke



Costume portrait
By C. and L. Davison

ones as possible, choosing varying types, young and old, weak and strong, men, women, and children, though the last-named are hard to get as subjects for study. Study also the works of Rembrandt, Velásquez, and D. O. Hill, these workers being chiefly notable for their portrayals of men. For the presentation of the feminine character, study Sargent, Reynolds, Raeburn, Gainsborough, Sully, and Gertrude Käsebier; and for children, Rosina Emmet, Lydia Field Emmet, Cecilia Beaux, and Mathilde Weil, though the character of a child is usually so unformed as to give little opportunity for expression. Especially should the worker note the effect of varying the quality of definition as regards different types of face, this being of great importance and being usually disregarded, particularly by those photographers who own soft-focus lenses. In general, it may be said that the face of a child or of an old person demands rather accurate drawing, while in the case of a person of middle age the definition may advantageously be softened; but this does not always hold true, strong faces frequently proving exceptions to this rule.

Above all, it should never be forgotten that a portrait, to be of value, must be pleasing, from its pictorial quality, to those who do not know the sitter, and must, at the same time, be an accurate representation of the features and character of the person portrayed.

Methods of Work

Early in his studies, the would-be portraitist must learn to subdivide his consciousness, so that he can look, think, and talk simultaneously. Then, on going to the sitter's house, he should ask to be allowed to look around, and should do so, making mental note of the possible arrangements which may be useful. The sitter will usually accompany him, or may be induced to do so by a casual remark. While looking around, the photographer should converse with the sitter, endeavoring to find some topic of interest which will eliminate the nervousness felt by one unaccustomed to posing, and all the while he must study the sitter—unobtrusively, of course—in order to determine how to express the latter's character to best advantage. The arrangement being decided upon, a comfortable chair is moved to the position desired, and the sitter is requested to seat himself, practice making it possible to adjust matters so that the pose required will be taken with few or no suggestions from the photographer.

About the Pose

Here it should be noted that the photographer should never, for any consideration whatever, touch the sitter with his hand, the most that is permissible being a slight arrangement of draperies, and even this is better accomplished by asking the sitter to make the desired change. For some reason, a touch puts most people, especially women and children, into a defensive attitude of mind that is fatal to good results through its destruction of a natural and unstrained expression. If any change of pose is desired, the sitter should be asked to make it, the request being made in the fewest possible words, and describing as accurately as possible what is wanted. In short, the effort of the photographer should be to pose the sitter without seeming to do so, and at the same time to occupy the sitter's mind with other topics. Of course, it is understood that when the sitter makes the familiar remark about "breaking the lens," or the other equally ancient one about preferring to go to the dentist rather than have a picture taken—three out of ten will use the first phrase and four of the remaining seven the second—the photographer should laugh as though it were quite new to him, and highly humorous, instead of having been rather pointless even in the days of its youth. However, either of these phrases offers an opportunity for some reassuring remark such as: "We'll try not to have it so bad as that," or something of the sort, serving to put the sitter into a good humor with himself as being quite a wit.

The Hands

"Few women, fewer men, and no girls, can pose empty hands gracefully." This statement, like almost all generalizations, is only partly true, but there is enough truth in it to justify the photographer in giving the sitter something to occupy his hands. If it be something which will occupy his mind during the preliminaries of arranging the camera and focusing—the camera should be set up before the sitter is placed in his chair—so much the better.

In the case of men, a cigar or cigarette will often serve, and may be useful as an accessory; while with women, gloves, a book, or knitting will do. A toy of some sort helps with the children, and with a girl of sixteen or thereabout nothing that I have found is of the slightest use, for they are the most difficult creatures in the world to pose gracefully. Occasionally one finds the rare one who can pose without self-consciousness, but in general I would rather do a portrait of a wild animal, using an 8 x 10 view camera, than of a high-school girl.

Nervousness

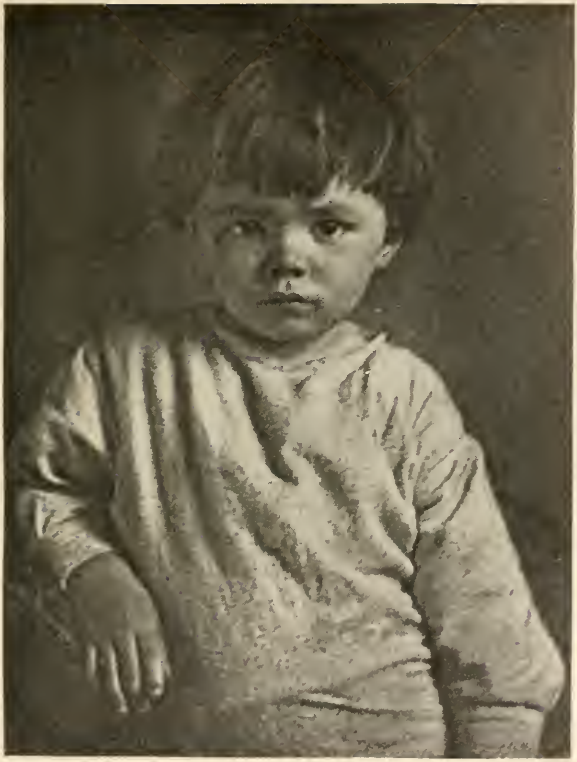
Nervousness is contagious, so the portraitist must learn to move slowly but surely, or, to put it better, to make haste without seeming to do so, to move accurately, that he may not have to do anything twice, and to avoid noise. He must, in short, be as unobtrusive as possible, and should strive to make the sitter forget what is going on. He must, however, be always on the alert for the characteristic turn of the head and facial expression which will come sooner or later if the portraitist has patience and can divert the sitter's mind as he should do, and this expression must be caught when it comes, for it is rarely repeated. A quick "Just stay that way a minute, please" will hold it, and the exposure may be made at once. Other plates may have been exposed before—in fact, this is usually the case—but they are not wasted even though they are generally thrown away, for they served to familiarize the sitter with the operation, thus putting him at ease, so that he did not shy when the proper moment for exposure arrived.

Against the Light

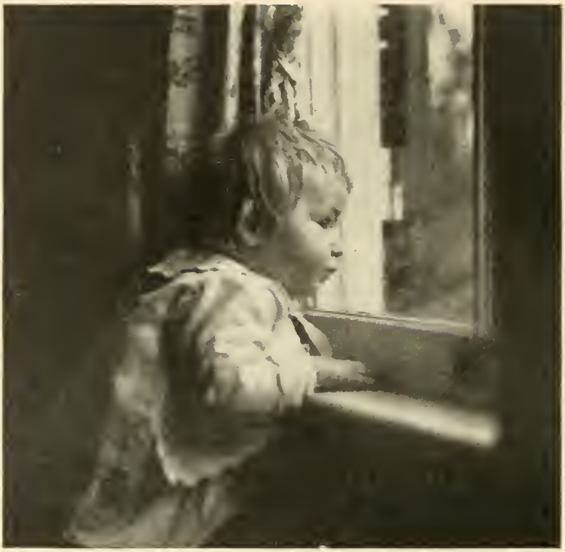
Many of the most beautiful effects in photography as well as in painting are those directly against the light, either indoors or out, and to accomplish these results the technique must be slightly different from that ordinarily used. In the first place, the effective contrasts are much stronger for a given subject than when the incident rays form an acute angle with the axis of the lens; and, in the next place, any under-exposure of the shadows will give heaviness and lack of transparence, militating greatly against the beauty of the result. It is therefore necessary to give ample exposure to the shadows, and at the same time means must be employed to prevent overexposure and consequent flattening of the lights. This involves the use of a double-coated plate, or one having a very long scale, such as the Cramer Isonon and the Paget Hydrazine. A ray-filter should be used, and the exposure should be long enough to permit of the shadow detail being developed to a satisfactory degree before the lights have become too dense. This means, in general, that the plate should have twice the exposure that would be necessary for the same subject if illuminated in the usual manner. It should be noted that slight overexposure is sometimes desirable for pictorial effect, a slight flattening of the lights aiding the illusion of intensely brilliant illumination. For subjects of this class a single lens is preferable to a double. Also, the lens should not be of too great focal length, or it will throw a large circle of illumination, thus causing general fog, and care must be taken that the inside of the camera is as black and non-reflecting as possible, a long bellows being very useful, for the corrugations serve to stop much stray light. Development should take place in a weak solution—not over half the usual strength—of some agent having a tendency to bring out detail first and build up density afterward, such as rodinal or metol, and should be arrested long before the negative has attained what would ordinarily be considered proper strength. Development should be stopped immediately if any tendency to development fog appears, though a slight amount of light fog may be present without doing any more harm than to make the negative a slow printer. Printing should be in as high a key as possible.

Cast Shadows

In working against the light or outdoors, the photographer will soon find that cast shadows are of great value; and this suggests that they may be of much more use than is generally supposed, even when not working against the light. For confirmation of this belief, we need only to look at some of the beautiful effects got by Baron De Meyer—who, however, is not a portraitist—by this means. Often it will be found valuable to light the sitter's face from two or more directions, taking care that the lights do not compete in interest,



"Can't, shan't, won't"
By Henry Hall



Window portrait
By Mrs. Jeanne E. Bennett

and that they are not of such a character as to give a bizarre appearance. I have read a statement by a writer on portraiture to the effect that a sitter's face should never be lighted from more than one direction, and am reminded thereby of a most beautiful portrait by John W. Alexander, in which this supposedly inviolable rule was flatly violated, with eminent success, thus showing that dogmatism is dangerous when dealing with art.

Artificial Light

The possibilities of flashlight for portraiture are unreasonably neglected, perhaps because of the unpleasant harshness so often characterizing the results, and the unnatural expression so often noticed in portraits done by this means; but if enough powder be used to give full exposure to the plate, and a good light be kept burning in the room during the entire proceedings, the result may be as good as can be got by any means. The light is necessary in order that the pupils of the sitter's eyes may not expand in the darkness, and that the flash may not take him by surprise, thus causing movement.

Lamps and Powders

Some form of open lamp should be used, with a compound powder, these burning more rapidly and with less smoke and residue than pure magnesium; and, as to quantity, fifteen grains of Agfa Blitzlicht is none too much for a single person, with a fast plate and a lens at *f* 7. The most convenient form of lamp is that in which the powder may either be piled in a heap or spread out in a long line, as in the "Spredlite," for by this means it may be arranged so as to give either a concentrated flash or a broad fan of light, thus permitting the attainment of sharp or diffused lighting, at will. The Eastman flash sheets are good if the sitter can be depended on not to move, but they require about a second to burn.

If a more diffused lighting is desired, it is advisable to hang a screen of cheese-cloth between the flash and the sitter, and it is well to fireproof the fabric before use. This may be done by soaking it in: Water, 80 ounces; alum, 8 ounces; ammonium carbonate 2½ ounces; boric acid, 1½ ounces; borax, 1¾ ounces. The use of a diffusing screen will necessitate a larger charge of powder, but no exact quantities can be given, conditions varying so greatly. It is not generally advisable to use flashlight with children or with nervous persons, as the shock of the discharge may be very unpleasant to them. For all artificial light portraiture an anastigmat at *f*/4.5, such as the Tessar Ic, is advisable because of its speed and capacity for giving well-lighted shadows.

Those fortunate enough to possess, or to be able to obtain, a Cooper Hewitt mercury vapor arc lamp are in a position to do very delightful work with great freedom, but I cannot speak authoritatively of the technique required, as I have never used such a lamp. However, much may be done with the ordinary Welsbach light and electric lamp, the exposures with the usual orthochromatic plates, running from one to five minutes, at *f*/8, and less with lenses working at larger apertures. Here the anastigmat is undoubtedly preferable to the slower types of lenses. No ray-filter is necessary in working with incandescent gas.

Outdoors

In outdoor portraiture the scale of values is usually shorter than indoors, and the key is much higher,—so high, in fact, that it cannot be reproduced on paper, and can only be suggested, by keeping the print as high in key as will give sufficient contrast for vitality, and by reproducing the relative values as closely as possible. (Note that sunlight is not suggested by strong contrasts.) It is not necessary to avoid either the shadow or the direct sunlight, for excellent work may be done with either diffused or concentrated outdoor light, but care should be taken to see that the sitter is not so dazzled as partially to close the eyes. The backgrounds of outdoors are especially likely to be obtrusive, and note should be taken that they are appropriate, simple in character, and focused in such a manner as to be neither unpleasantly blurred nor over-defined.

Of course, the more intense light is very helpful if the sitter has any tendency to move, for even with a ray-filter, exposures may be very rapid, and if the worker is fortunate enough to possess a Graflex he is in a position to do very satisfactory portraits of children, as the sitter —so-called—may be followed around and photographed whenever a pleasing arrangement appears. The fact of the work being done outdoors may often be taken advantage of to introduce accessories which would not be possible in the house, as in the pictures by Mathilde Weil in THE PHOTO-MINIATURE No. 58, and the very beautiful portraits by Clarence White.

The Negative

In the great majority of cases, a negative much softer in contrasts than the ideal of the average portrait photographer will be desired, and may be secured by the means indicated under "Development." Some after-treatment of the plate is often desirable, though this should be avoided as far as possible, an admixture of hand-work with the drawing of the lens being liable to show, and being very offensive when this is the case. I have never been in sympathy with those purists who claim that no personal intervention is permissible, for I hold that any means are legitimate if the effect demands them, but I do maintain that the artist should not permit it to be seen that he has mixed his mediums. To be sure, if one is making *photographs*, then he must not do any hand-work, nor must he shade the frame in printing, nor even reduce or intensify his negative; but if he is making *pictures* he will not pay any attention to the purists, but will do anything that will give him the result he is trying for, and simply take care that the means are not apparent.

Reduction

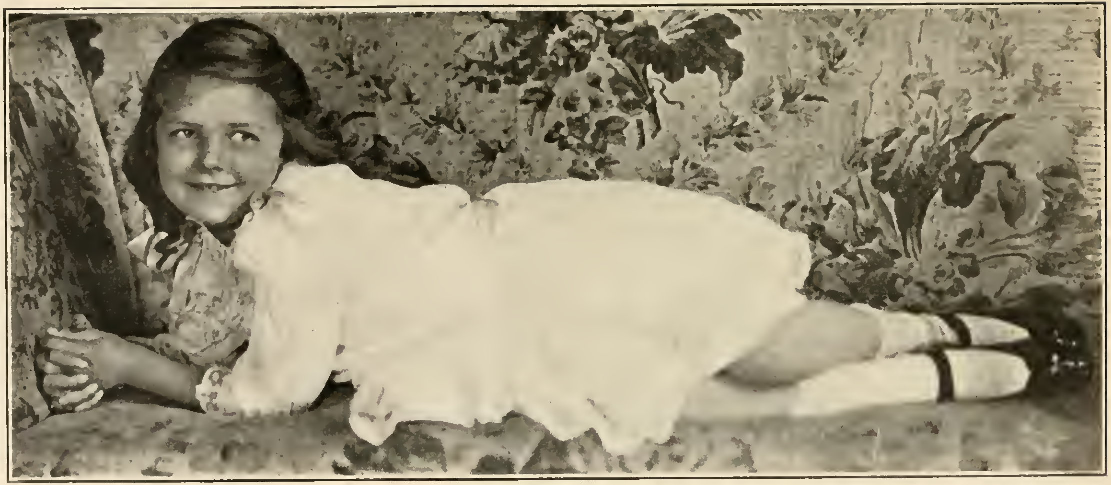
For reduction, the best method that I know of is to employ Farmer's reducer, varying the result by modifying the manner of application. Farmer's reducer, as is well known, consists of a mixture of hypo and potassium ferricyanide, but it is not so generally known that an excess of one or the other of the ingredients will modify the manner of action. Thus, if the negative be soaked for an hour or so in a strong hypo solution (25%) and then be placed in a weak solution of the potassium ferricyanide and rocked gently, the density will be reduced and at the same time the contrasts will be diminished, for if the hypo be in excess the solution will attack the denser portions first. Conversely, if the ferricyanide be in excess, the thinner portions are the first to be affected, and contrast is increased. This is carefully explained on pages 369 and 370 of THE PHOTO-MINIATURE, No. 116. Local reduction may be accomplished with a camel's-hair brush or a tuft of cotton, soaked with the reducer, and should preferably take place as soon as the negative is removed from the fixing bath, and before washing. Failing this the plate should be soaked for an hour or so in hypo solution before reducing. In reducing locally (and to a lesser extent in general reduction) it is well to rinse the plate in water before holding it up for inspection, as streaks may result if this is not done. Ammonium persulphate should be avoided, as it is uncertain in its action.

Intensifying

Many intensifiers are available, some good and others not, but my own preference is for the following: Water, 10 ounces; potassium bichromate, 100 grains; hydrochloric acid C. P., 50 minims. Bleach in the above, wash in running water until the yellow stain is gone, then blacken in a solution—the strength is immaterial—of rytol, amidol, metol-hydroquinone, or rodinal, and wash for half an hour in running water. Local intensification I prefer to carry out with a pencil, working on the face of the plate for fine work, and on the back when the effect is to be broad.

Hand-Work

To work on the film, dampen a cloth with turpentine, 4 ounces; rosin, 120 grains, and rub over the film. This gives a good tooth, and a fine-pointed B or HB pencil may be used freely. If it is desired to work on the back, the following mixture is flowed over the cleaned and dusted plate, and a pencil or stump is used, blending the marks with the finger: Ether, 24 ounces; benzole, 12 ounces; gum sandarac, 2¼ ounces; gum mastic, ¼ ounce. Both of these formulæ are taken from the manual of the G. Cramer Dry Plate Company, and give the best retouching medium and the best ground-glass substitute that I have ever found, the former being far superior to most of the commercial forms. Retouching should, however, be confined to removing the appearance of the facial blemishes which were present in the original, or which the color-blind plate has exaggerated, and should never take the form of removing or even



A delightful bit of home portrait work
By Agostine Strickland

modifying character lines, nor should modeling be attempted. The light and the lens will model a face far better than can be done by hand, and, if an orthochromatic plate and ray-filter be employed, it will be found that retouching is unnecessary in all but about one case in a thousand; while if a soft-focus lens be used in addition, manipulation may practically always be confined to the raising and lowering of the values of large spaces that would otherwise be inharmonious. Should it be desired to remove the retouching, a cloth moistened with the medium will take it off; while, if the work is to be removed from the back of the plate, it is necessary to clean the ground-glass substitute off with alcohol.

Printing

We cannot here go into the discussion of printing mediums to any great extent, but the reader is referred to an article by the present writer which appeared in the June and July, 1913, numbers of "American Photography," for a consideration of the relative value of various printing methods. It may be said, however, that there are four mediums which will appeal to the careful worker, namely, platinum, carbon, gum and gum-platinum—or gum-carbon—as combining quality and permanence, these being the prime requisites in the better class of portraiture. The use of bromide paper affords two interesting possibilities in the way of softening definition in enlarging, the first involving the use of bolting silk in the manner described in THE PHOTO-MINIATURE No. 87, the other the use of a soft-focus lens on the enlarging lantern; in the latter case the definition being the same as though a soft-focus lens had been used for making the original, except that the diffusion will be uniform throughout the planes, instead of being progressively greater in the distance. Of course, these methods are equally applicable to the making of enlarged negatives, their chief value lying in the fact that it is possible to use a small, and therefore comparatively cheap, but fast anastigmat on the small camera.

Finishing

No special notes need be given as to the presentation of the finished print, for this will depend on the character of the work and on the personal taste of the photographer.

But it may be said that if the work is being done commercially proofs should never be shown, the quality of proof paper being so different from that of the finished print that disappointment is almost sure to result. This is by no means to say that the quality of proof paper is superior to that of platinum or carbon—quite the reverse; but if the sitter has seen one kind of print and has made up his mind to that quality he will often fail to recognize the fact that he is getting something better when he sees the finished print. Therefore, show only finished prints, and show more (from different negatives) than it is thought the sitter will order. If this is done, the original order will often be increased. I have sold as many as seven prints from an order that originally called for but three, and, though it may seem wasteful to work in this manner, the expense of making extra prints is slight compared to the price that may be asked for them.

In conclusion, I would repeat what I said at the beginning, that I do not wish anyone to take what I have said as the only means of salvation ; but to experiment, to select those methods best suited to give the results he desires, and, if possible—and it is by no means impossible that this may be the case—to prove me wrong ; for this will mean that he is thinking—and no one can be an artist without thinking, and thinking long and hard. So if I have stimulated anyone to do this I have done better for him than if I had written out the whole art and science of photography for him to absorb without effort.

PAUL L. ANDERSON.

Notes and Comment

The many friends of Mrs. Catharine Weed Ward, wife of the late H. Snowden Ward, will hear with keen regret of her death, which took place on July 31 at her late home, Golden Green, Hadlow, England. After the death of her husband, about eighteen months ago, Mrs. Ward returned to England with the intention of finishing several works in which her husband and she had been associated, and spoke hopefully, on leaving this country, of perhaps taking up photographic activities again. But her health began to fail, and some months ago it became plain that she could hardly recover.

Mrs. Ward was one of the few pioneers left of the first women photographers, her use of the camera dating back to 1888. Her skill in photographic technique was considerable, and she was an earnest advocate of the older methods, having no use whatever for such frivolities as roll films, tank development, and other modern innovations. Latterly she was associated with H. Snowden Ward in the illustration of books of literary and antiquarian interest, and made with her own hands most of the illustrations of her husband's books and lectures on Dickens, Shakespeare, and Chaucer. She was a woman of marked individuality, of progressive mind and broad culture. She made friends slowly, but showed to all an infinite courtesy and consideration which won their respect and affection.—R. I. P.

The National Convention of the Photographers' Association of America, which met at Kansas City late in July, was a huge success in attendance and practical interest. A full account of the proceedings will be published in the "Annual," issued by the Association, which is promised for an early date. Meanwhile, some account or the affair may be seen by those interested, in the recent issues of "Abel's Photographic Weekly," Cleveland, Ohio, and "The Bulletin of Photography," Philadelphia, Pa.

Among the novelties of the convention was the introduction of a special non-curling, non-halation cut film, by the Eastman Kodak Company, and intended to replace the plates now used universally by professionals. This new film is coated with the regular portrait emulsion, and is easily etched or retouched on either side. The wonder is that such a thing was not introduced long ago. Apparently it is not intended for amateur use, the smallest size at present listed being 5x 7, but one may safely prophesy that amateur sizes will not be long delayed.

Another novelty of the convention was the presentation of a "proposed Bill" Defining and Regulating the Practice of Photography, and for the Creation of a Board of Examiners in Photography, Prescribing their Powers and Duties. The bill, when read at the Photographic Congress, was adopted with much enthusiasm, that is, it was endorsed by the photographers. The only word one can say about any such bill is that applied to it by Juan C. Abel in his "Weekly," viz: that it is "the most absurd of all suggestions."

The Bausch & Lomb Optical Co., Rochester, N. Y., has just published a catalogue of its photographic lenses, notable for the quantity and quality of its lens information and the profusion of its splendid illustrations. Half an hour spent with this catalogue will give the reader a liberal education in plain facts about lenses, and we suggest that our readers should obtain a copy.

According to a report in "The Evening Post," New York, August 16, the long litigation between the Eastman Kodak Company and the Ansco Company, covering the patent rights to the manufacture and sale of sensitized photographic film, has resulted in a decision, handed down by Judge John R. Hazel, of the U. S.

District Court of Buffalo, in favor of the Ansco Company as the owners of the Hannibal Goodwin patent of 1887, the validity of which is upheld by this decision.

The final issue of the suit will, of course, be determined on the appeal to the United States Supreme Court, but the present decision is interesting as showing the present stage of this litigation, which has now been continued for over eleven years.

There is a report current that the Eastman Kodak Company has purchased the American rights in the color photography patents of Gaumont & Co. of Paris. These patents, as we recall them, relate almost entirely to color photography for the moving-picture film.

Since "Wilson's Photographic Magazine" was disposed of by Mrs. Edward L. Wilson to the Edward L. Wilson Co., Inc., last March, the new editor of the magazine, Mr. Thomas Coke Watkins, has made many changes in its format and general make-up. Apparently new money and new energies are at work to bring this oldest of American photographic magazines to its proper place ahead of its contemporaries. Our acquaintance with "Wilson's" runs back almost "time beyond memory." When we first knew it, it was acknowledged to be the most interesting journal in the world for those who follow photography as a profession. In the writer's opinion, it still maintains that reputation. The professional who "gets along" without "Wilson's" loses much that might be to his practical advantage.

The Home Portrait Graflex, just introduced by the Folmer & Schwing Division (Eastman Kodak Co.), Rochester, N. Y., is, as its name implies, especially designed to meet the requirements of those making portraits at home. It is undeniable that a camera of the reflecting mirror type is superior to all others for this kind of work, regardless of individual opinions on the other side. Quite a few skilled home portraitists cling to the use of the old form of view camera, but there can be no question about the greater usefulness of the Graflex, for instance, and the larger possibilities of success which such a camera offers. The new Graflex is very fully described in the 1913 Graflex catalogue, which can be obtained from the F. & S. Division, as above, on request.

Of the many ways of finding the correct exposure for plates or films, the use of Heyde's Actino-Photometer (Herbert & Huesgen Company, 456 Fourth Avenue, New York) is undoubtedly one of the best and most reliable. The Heyde A.-P. is an instrument of precision and gives definite information. It is very fully described and its advantages shown, with a lot of useful data about exposure and plates, in a booklet just issued by the Herbert & Huesgen Company, which every amateur should see and read carefully.

The Cleveland (Ohio) Camera Club, briefly noticed in our last issue, has completed the work of organization and is now giving a Midsummer Exhibition, showing about 150 prints by some 30 exhibitors, at the Case Library. Amateurs in Cleveland and vicinity would do well to get in touch with the secretary, Mr. A. D. Williams, whose address is Box 102, Cleveland, Ohio. The advantages of the Club are many, and the individual worker should not overlook this opportunity of improving his work and broadening his photographic horizons by association with others interested in his hobby.

There is a wonderfully interesting article on "Little Cameras and Big Cameras," by Charles F. Rice, in the June number of "Camera Craft," San Francisco, Calif. (10 cents). Mr. Rice seems to be thoroughly acquainted with the possibilities of the little camera, and his illustrations amply prove his claim that it is in all respects equal in efficiency to the big camera.

The Burke & James 1913 catalogue is now ready, and runs to over 300 pages, profusely illustrated. This enterprising firm controls and manufactures many photographic specialties which are not described in other trade lists. The new catalogue is a veritable encyclopedia of photographic information, and the reader will do well to obtain a copy and go carefully through its crowded pages. (Burke & James, Inc., 240 E. Ontario St., Chicago, Ill.)

The Allendorf Company, 306 New England Building, Cleveland, Ohio, American agents for the M.O.I.A. lenses, made in Munich, announce their new catalogue of the M.O.I.A. objectives as ready for distribution. The Helimar Series VII, aperture *f*/6.8, seems to offer special advantages for home portraiture. This lens is symmetrical in construction, so that the rear lens may be used alone, giving twice the normal focal length and an image double the size of that given by the complete system. It is noteworthy for its unusually large area of illumination and definition and also for its very reasonable price.

Mr. H. O. Bodine, of the Wollensak Optical Company, Rochester, N. Y., writes me that the demand for the "Verito Book" is running to such proportions that they will be obliged to issue a new edition. The Verito book contains some clever pictures and much interesting information about "soft focus" photography. Readers of THE PHOTO-MINIATURE can obtain a copy, without charge, by writing Mr. Bodine and mentioning this note.

If your summer work has given you a few choice pictures, with pictorial advertising possibilities in them, do not overlook the Three Thousand Dollar Kodak Advertising Contest, which closes November 1, at Rochester, N. Y. Get the descriptive circular from your dealer, and then, in popular phrase, "get busy."

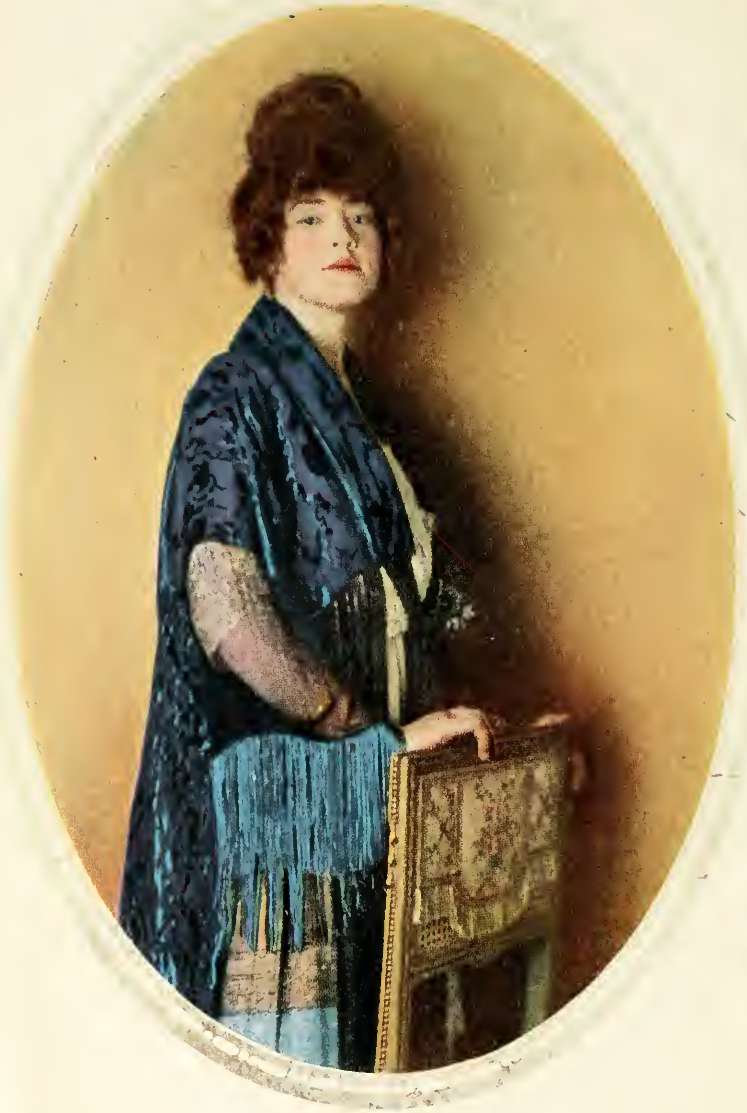
With the autumn so near, and all its wealth of color and beauty out-of-doors, the man who is satisfied with nothing less than "something better than he got last time" will try out the much-advertised advantages of color sensitive plates for outdoor work. We suggest that the Imperial Orthochrome (with a ray filter) and Imperial Non-Filter (without a filter) (G. Gennert, New York, Chicago and San Francisco) be included in this experimental test. And, by all means, insist on having the plates "backed." You will be surprised at the improvement you can make in your work by following this simple suggestion.

Elsewhere in this issue we publish a list of "Out of Print" numbers of THE PHOTO-MINIATURE Series. This lot has been made up from all sorts of sources, but the numbers are complete, although perhaps a little soiled as to covers. Those who want special numbers, or are completing their sets, should not delay, as in many instances we have only one or two copies of the various numbers listed.

The new IPSCO catalogue of the International Photo Sales Corporation, 235 Fifth Avenue, New York, is unique in that it is the first catalogue describing a complete line of foreign-made cameras that has ever been printed in America. It describes some thirty-two varieties of pocket- and hand-cameras made by German firms. The descriptions are concise, but very comprehensively detailed, and the catalogue includes a number of specialties intended for the convenience and helping of those who use small cameras. The I. P. S. Co. will be glad to send a copy of this catalogue to any reader mentioning this note. And it is worth sending for.

The advantages of the telephoto lens in portraiture are not yet so widely appreciated as might be by either amateurs or professionals. Such a lens not only ensures very much better drawing in the portrait than the ordinary portrait lens of short focal length, but also gives a much larger image than is obtainable with the normal lens. For example, the Ross "Telecentric" lens is not only a rapid long-distance objective, giving enlarged images with an aperture of *f*/5.4, but it is also an ideal inexpensive portrait lens for use with plates not less than 5 x 7 inches. This lens calls for an extension of 17 inches and covers a 5 x 7 plate with a three-quarter figure portrait at a distance from the subject of a little over 12 feet. George Murphy, Inc., 57 East 9th street, New York, the American agents for the Ross Telecentric, have recently delivered a 24-inch "Telecentric," *f*/5.4, to the photographic department of a metropolitan newspaper. This lens has a normal focal length of 24 inches, and is one of the largest objectives of this class yet made. It covers an 8 x 10 plate at full aperture *f*/5.4, the lens having an outside diameter of 4¾ inches. We hope to obtain a specimen of the work of this giant lens, and will reproduce it in these pages.

An Oregon subscriber, who has followed our suggestion to "put the first good print from every negative into a Royal Album," writes us enthusiastically about his pleasure in the Royal Album line and the "Album Habit" in general. Like ourselves, he finds that the "Album Habit" ensures the preservation of one's prints in perfect condition, and prevents one from giving the last print away on the generous impulse. Get the "Album Habit" and insist on a Royal Album. (F. L. Schafuss Co., 200 Fifth Avenue, New York.)



PORTRAIT FROM LIFE

Reproduced from an Autochrome by Jno. W. Allison, with the Panchrom
Flash Powder. 15 grammes powder; light, 7 feet from
sitter; exposure 1 30th second; lens F 6.3

The Photo-Miniature
A Magazine of Photographic Information
EDITED BY JOHN A. TENNANT

Volume XI JULY, 1913 Number 128

All About Color Photography

The aim of the present monograph is to tell the reader all that he may reasonably want to know of the present-day processes of color photography. Not of each and every process which man in his ingenuity has devised; but of the methods which have passed the ordeal of trial in practice, and have proved themselves capable of responding to the desire of all photographers to add the charm of color to the other fascinating qualities of photography. Now, while this aim is an eminently practical one, it would be a disservice to the reader to introduce him to the processes of color photography without first endeavoring to familiarize him with the principles upon which they rest.

This first task is not an easy one, for in color, as seen in a landscape or a face, we have to deal with something which is more complex in its nature than the shape of objects, which we so readily photograph. Take any single object, say, a vase, or a collection of objects, such as a whole landscape. Viewed from a given standpoint, its appearance is fixed except in so far as changes in the position of the light by which it is illuminated makes play of lights and shadows. Yet the effects of such changes are usually small, and it is easy to see before our eyes the way in which they are brought about, whilst the objects seen or photographed remain substantially the same as regards form. But as regards color!—we have only to look through an orange or violet glass to see havoc made of the colors which we call "natural."

Again, we see that grass is of the color we call green, but abnormal eyes will match it with red, failing to distinguish between the two. And then when night falls, color goes with the light, and we learn that it is not something of itself but is called into existence by light; that it changes when the light changes, and is dependent as much upon light for its quality as upon the nature of the object which exhibits the color. We have grown so familiar with speaking of, for example, a red rose or yellow tulip that we forget to consider that the redness or yellowness is conditioned also by the daylight. View your red rose and yellow tulip in an orange light, such as you use for the development of plates, and their colors are no longer those characteristic of them. Light thus playing a leading part in the making of color. We must first learn a little of it.

Light and Color

It took natural philosophy a good many years to discover that the source of the colors of natural objects is the white daylight which plays upon them. When Newton found that white rays of sunlight could easily be split up into a whole series of colored rays (the spectrum), it became possible to account for the facts of color: to form a theory of color which proved its truth by leading to the discovery of fresh facts.

Briefly, the color of an object is not a fixed property of the object. What is a fixed property is the power to absorb rays of light of certain colors. The rest are reflected. If the light which falls upon the object is deficient in certain of the rays which are reflected, the color differs from that which the object assumes in a light containing all the unabsorbed rays. If the light lacks all the rays which are unabsorbed, none, of course, can be reflected—the object looks black. One can imagine a world illumined only by one particular species of color ray which would be either wholly absorbed or wholly reflected. A world only of black and that one color. A purgatory for drapers and costumers. Let the extreme example suffice to impress this quality of absorption of some rays and the reflection of others, which is the cause of color, and the cause of its changes.

In parenthesis, it should be said that anything of a color which absorbs rays of a given color is said to be "complementary" in color,—that is the rays transmitted by each separately added together make up white light. Thus, the pure red rays are cut off by a screen of color made up of the remaining colors of the spectrum, viz., greenish blue. The one color is said to be the complementary to the other.

How We See Colors

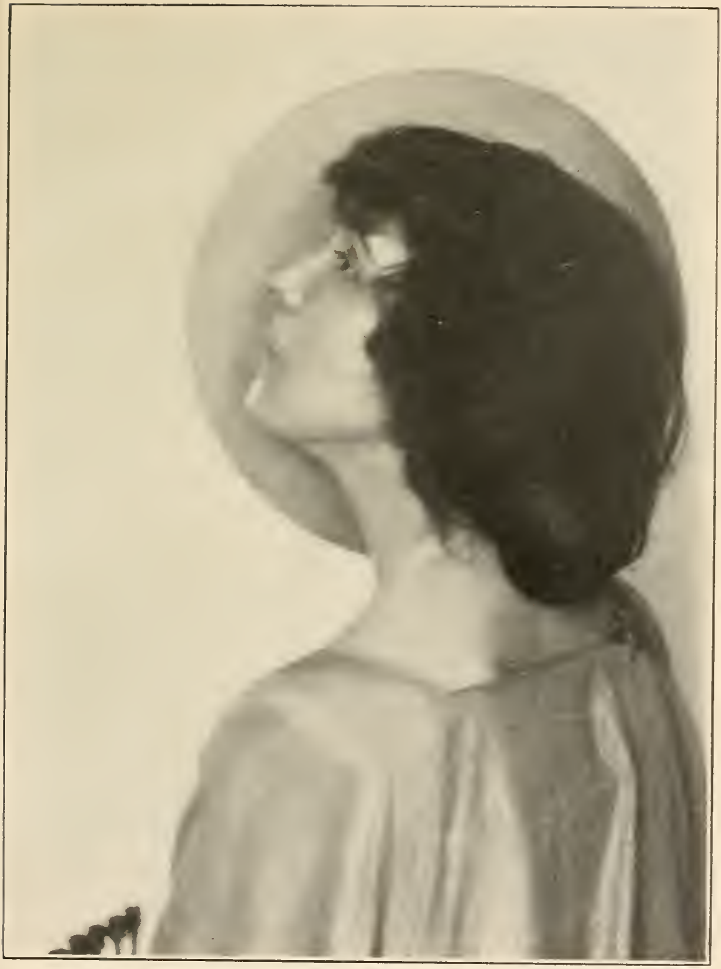
But we must go a step farther, and consider how the eye can recognize the infinite series of hues in Nature. The conclusion to which modern scientific men have come is that the eye does this by means of the three different sets of nerves, one set capable of responding to red light; another responding to green light; and a third, to blue, or rather blue-violet light. It is believed that the eye nerves can actually respond to no other but these, yet can obtain the impression of every conceivable color from the greater or less effect of one or more of all three colors upon the nerves. A pure red color will excite only the nerves which cause the sensation of red, but pure colors are rare in natural objects, and in most cases all three "color-sensations" will be created in impressing a particular hue upon our consciousness.

This theory of how the eye sees color rests upon a sound basis of much experimental evidence. Difficult as is the identification of the exact mechanism of the eye, it is certainly highly probable that the eye does perform the process of first singling out the red, green, and blue-violet in a color and then recombining them to create the sensation of a compound color. It should be mentioned that the sets of nerves of the eye are not so sharply sensitive to but one particular color as is, perhaps, suggested by what has just been said; each color-sensation tails off a little into the next, but each is of the predominant character described by the words "red," "green," and "blue-violet." Indeed, even if the mechanism of the eye be found ultimately not to consist of three simple nerve sensations, it is an undoubted fact that mixtures of these colored lights, suitably chosen, can imitate all colors, and these colors cannot be distinguished from pure colors. It is this fact which makes three-color photography possible, whether our eye possesses three sensations or a thousand. For a more detailed account of color the reader is referred to the text books.

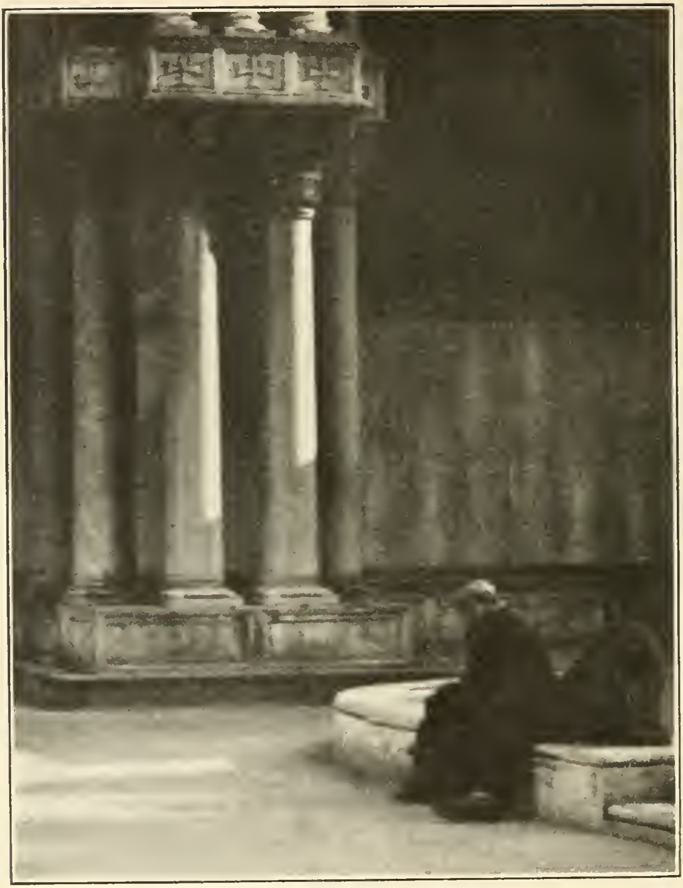
Color Photography Also Singles and Recombines

Now most processes of color photography are based on precisely this theory of color vision. They do by photography what the eye does by its own special mechanism, that is split up (by means of suitable filters) the rays coming from a colored object into three sets—red, green and blue-violet—and allow these separately to record their effect upon a plate of suitable sensitiveness. We thus get records—in negative—of the effect of these various component rays. They are obtained in positive form by printing transparencies from the negatives. These are the true registrations of the separate color-sensation. We recombine them—again imitating the eye—at the same time supplying to each the color which it registers.

This recombination may be done in several ways—either on a lantern screen or in various viewing instruments, or by pigment colors having appropriate absorptions. Such is, in brief, the basis of all "tri-color" processes of reproducing colors. It was laid in 1861 by Clerk Maxwell, whose principle of color reproduction, then made known, is now universally accepted—with, however, the vital modification by F. E. Ives, in 1888, that, in making the records of color effects, the set of three filters must transmit all the rays of the spectrum (those into which white light can be split up), whilst for reproducing the colors, from these records, the filters must transmit only narrow parts of the spectrum, representing the three fundamental colors. We shall see, when we come to the actual processes, the important bearing of this addition to Clerk Maxwell's discovery upon practical work. We may now turn to this part of our subject. While we have not said enough here fully to deal with principles of color reproduction, the rest is best left for consideration with the details of the methods.



The Angel of the Holy Grail
By W. and G. Parrish



The Pillars of Saint Mark, Venice
By John W. Knapp

Color Photography by Projection

Perhaps the simplest and most perfect method of color photography is that worked out by F. E. Ives, and embodied by him in two forms: (1) Projection by a lantern on a screen, and (2) viewing in an instrument (the Kromskop). Dealing first with projection: The first thing is to take the negatives recording the redness, the greenness, and the blueness* in the scene or subject. This is done by making the exposures through three light-filters, viz., colored screens, which let pass, one, red rays; another, green rays; and the third, blue rays; the three all together passing the whole range of rays in the spectrum, from red to violet. The positive or transparency from each of these negatives is a reproduction of each of these three primary colors in terms of clearness. In other words, where a pure red color, for example, formed part of the subject, the transparency from the red-screen negatives shows clear glass; in another part, where some red existed, it shows a medium density; in another part, where red was absent, it shows its greatest density.

Imagine that you are holding such a transparency up to the light or projecting it on the lantern screen. You realize that, in proportion as it transmits light to your eye or to the screen, it is telling you how much red there was in the subject. "Telling" you, I say; but, if we put a transparent red screen against the transparency, we shall *see* the red in proportion as the transparency allows us. We have separated its redness from the original scene, and we now have to combine it with the greenness and blueness obtained in a similar way.

Ives' Lantern Kromskop

This is done in the Ives' Lantern Kromskop by providing each of the three transparencies with a lens, these lenses being of the same focal length, so adjusted that the three images register on the screen. Each transparency is provided with the colored screen, red, green, or blue, corresponding with the color it records, so that we combine on the screen the redness, the blueness and the greenness in the subject. Result: the full range of hues which, as we have seen, these three colors can form.

---

*Henceforth for brevity in this monograph we will write "blue", instead of the more correct blue-violet.

The limitations of this method are: First, the loss of light consequent upon the rather dark color screens which are necessary; secondly, the necessity of preserving the same size of picture on the screen, or of providing delicate adjustments for the angling of the two outer lenses to the center one. But within these limits the method is as perfect as has ever been devised. Although other inventors and constructors have designed variations in the apparatus, none have any features distinctive from the Lantern Kromskop, and none, so far as I know, have proved capable of such fine, because faithful, renderings of color, saving, perhaps, the beautiful three-color cinematograph projections of M. Gaumont briefly described on a later page.

Viewing Without a Lantern

The three-lens lantern is but an optical device for making or combining the three separate images into one; other means may be used to attain the same end. Thus, Mr. Ives designed an apparatus (the Kromskop), in which the three separate transparencies are brought into optical register by means of an arrangement of mirrors. It allows of the color results being viewed by daylight or, if necessary, by artificial light.

The Ives' Kromskop

It consists of a box of the form shown in Fig. 1. At *A*, *B* and *C* are the red, blue and green color screens in which are the respective transparencies, the box being provided with adjustable stops for securing register of the three images. At *E* and *D* are transparent mirrors, in which the observer, with his eye at *F*, sees the red and blue components of the color effect in combination with the green; and *C*, which is viewed directly. The total result is the same as by projection on a screen, but the viewing instrument obviates the space and trouble inseparable from a lantern display, and moreover allows of the effects being seen stereoscopically as well as in colors. In making the negatives, it is very little more trouble to take stereoscopic pairs, and the added realism thus obtained when viewing scenes or still-life subjects in color is very great.

Cameras for Three-Color Negatives

The set of three negatives (each taken through a different light-filter) which is necessary for such processes as Ives', may be made in an ordinary camera, but this plan is by no means the best for several reasons. The time taken to change plate-holders and light-filters makes it impossible to photograph many subjects; there is a liability to shift the camera or alter the focus-setting, and so ruin the essential identity of each negative as regards size and sharpness of image; and there is great opportunity for making mistakes, such as double exposures, or using a wrong plate for a given filter.

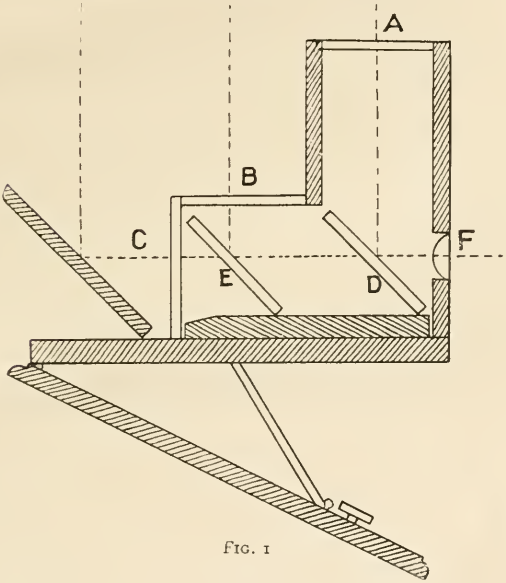


FIG. 1

Many inventors therefore, Mr. Ives and Mr. Sanger-Shepherd chiefly among them, have devised apparatus to facilitate the making of the three negatives, and even to take all three at one single exposure. Of all these, perhaps the one of most practical usefulness is a repeating back which can be fitted to any good camera and carries the plate or plates with the light-filter requisite for each. Owing to the different sensitiveness of plates to the rays of different color, it is generally necessary to give a longer exposure through the red and green filters than through the blue, or, instead, to use a larger diaphragm in the lens; but, even when making such adjustment between the exposures, all three negatives may be taken within five or ten seconds under favorable conditions—a time which is short enough for a very wide range of work.

The drawback of three separate exposures has, however, been obviated by various means. Three separate lenses have been used. This system suffices for fairly distant scenes, but breaks down for very near objects, owing to the fact that each lens is at an appreciably different view-point; the negatives are slightly different and images will not combine into one. The alternative is to use one lens only, and to use reflectors within the camera in order to form three separate images, each on a separate plate and through a different light-filter.

It would lead us too far from our subject to describe the various cameras which have been designed on these lines. All of them are on the principle of the Ives Kromskop used the other way about: that is, the light enters the lens, and the rays which usually form one image only are caused to form three. As a rule, one image is formed by direct (unreflected) rays, and the other two by reflection from transparent screens, which also serve as light filters. In England, two such cameras are on the market—those of Messrs. Sanger-Shepherd and Mr. E. T. Butler.

Additive Processes

The method embodied in the lantern or Kromskop viewing instrument is termed an "additive" method. The hues of the subject are produced by adding one colored light to another in various proportions. The result is not a color photograph, for it has no separate existence. It is simply an effect obtained by the optical union on the lantern screen, or in the eye of the observer, of the redness, greenness or blueness in the subject. Despite its beauty and fidelity, such a process as this proved unsatisfying. People asked for color photographs, and inventors such as Mr. Ives gave them, not something which they could hold up and say "This is a photograph in natural colors," but a passing effect seen for a while on a screen or in a stereoscope and separable into three ordinary photographic transparencies. The Ives Tripak, which gave the three color records by a single exposure, from which transparencies in color were afterward made, for viewing in an instrument called the Colorscope, came later, but these are apparently not yet commercially obtainable.

It is no reflection upon the genius of the inventors of such methods and apparatus to record that they failed to receive widespread favor, and no surprise to learn that commercially they were not successful. It was reserved for other inventors to remove both these reproaches from the additive process of color photography. We will deal directly with the ways in which this was done. But it will be most convenient to consider first the so-called "subtractive" methods, which followed next in order of time upon the Kromskop. For some years these attracted many inventors and practical workers, by whom most beautiful results were and still are being produced.

The industrial development of these "subtractive" methods has been gigantic, has supplanted lithography very largely, has revolutionized the illustration of books, weekly and daily papers. This, *en passant:* Our business is with the methods which are open to the photographic worker. And first we must understand the principle of the subtractive process. This, in its many forms, yields actual prints or transparencies in color. Though it is perhaps not quite correct to speak of them as "photographs in color," yet they answer to that description more nearly than do the results of any other process at present available.

Subtractive Processes

Let us go back for a moment, and recollect that in the Kromskop method we produce by photographic means the redness, greenness and blueness of the original. Our transparencies in front of the screens of these colors act in reality like stencils: not the crude space-and-opaque stencils such as are cut by hand, but beautifully graduated, and transmitting the colors in the proportion in which they exist in the original. The three graduated patterns (images), each in a colored light, are combined to re-form the hues of the original subject. Now, in the subtractive process our aim is to effect a combination, not of lights but of actual pigments, on a white opaque surface (print) or on a transparent surface (transparencies). What is the method which must be followed? As in the additive process, we make negatives which record, in negative, the redness, greenness and blueness of the subject. Take a pure red in the subject as an example, and think what we must do to re-form a red in making a print on white paper. Remember that the white paper support in reality is reflecting all colors. To get a red, it requires to be covered with colors which will absorb the colors except red from the white light which is reflected, that is, green and blue.

Now, as we have learned from the first part of this monograph, the color to be used to absorb rays of a given color is the complementary of that color—that is, of green, pink; and of blue, yellow. Apply this now to our example.

The part of the negative recording our pure red is of great density. The positive from it is clear or pure high light. In the case of the negative recording green, the part corresponding with our pure red is clear; in printing it on a paper or plate we obtain a pink patch. In the case of the blue-recording negative, we get on top of our pink patch one of yellow. The two together absorb all rays but red from the light, that is we get a red. It is not sufficient that the printing colors be merely complementary; they must reflect all the color they are not required to absorb. Thus, a complementary might be a very narrow color, which would be unsuitable.

The same process holds good in reproducing a pure green object. White paper to start with. No deposit on it in printing from the negative recording green. From that recording blue, a patch of yellow (which absorbs the blue); from that recording red, a patch of blue-green (which absorbs the red). Thus, blue and red are absorbed and green remains. Go over this again, good readers. See how it supplies the principle common to all the subtractive methods of color photography; of making a bluish green from the redness negative, a pink print from the greenness negative, and a yellow print from the blueness negative, and superimposing these prints one on another. If they are placed upon a paper or other white support, light passes down through them and is reflected back; if they are upon glass, white light comes through them on holding the transparency to view it or projecting it in a lantern.

Various Subtractive Processes

The principle of the subtractive process has been carried out in an innumerable number of ways. A whole PHOTO-MINIATURE might be filled with mere outlines of them, but very few have been practised by any but the inventors. At the present time (1913) it may be said that only three purely photographic methods are in use: the Sanger-Shepherd (for transparencies), carbon and variations of it and pinatype. The screen plate processes of color photography, such as the Autochrome (see p. 398), have killed most of the interest which was taken a few years ago in these methods of three-color printing. But the industrial use of color photography has been solely on the lines of three-color printing done from half-tone blocks or collotype plates and printed by machine. These photo-mechanical methods are, however, beyond our present province. They are described and illustrated in Horgan's "Half-Tone Processes" (1913).

The Sanger-Shepherd Process

The subtractive method for making three-color transparencies has been brought to a high degree of perfection by Mr. Sanger-Shepherd, from whose firm the materials for the process are supplied. As in other subtractive processes, we require to make:

From the redness negative, a bluish-green image;
From the greenness negative, a pink —— image; and
From the blueness negative, a yellow image.

The first of these is obtained by making an ordinary transparency on a lantern-plate, and toning it in the familiar way to a greenish blue. The pink and yellow images are made on thin celluloid film coated with emulsion in the usual way. The gelatine of the emulsion is rendered sensitive to light by bathing the films in bichromate solution. The dried films are printed from the greenness and blueness negative and developed, as in the carbon process, in warm water, by which an image in clear unsoluble gelatine is formed, the soluble parts washing away.

The sensitive silver bromide of the emulsion itself takes no part in the process except that of showing when the film has attained a correct degree of relief. It is dissolved out in a hypo bath, and colorless relief images are then immersed in solutions of pink and yellow dye respectively. The dye fixes itself to the gelatine, which has been rendered insoluble in the printing.

The pink and red transparencies so obtained are cemented in register with the blue image on the glass with Canada balsam. Most beautiful transparencies have been made by the Sanger-Shepherd process, chiefly by British workers. The extreme clearness of lantern-slides by this method allows of their being shown by illuminants of moderate power. They are also quite free from any structure or pattern, and, therefore, may be magnified to any desired size without loss of definition.

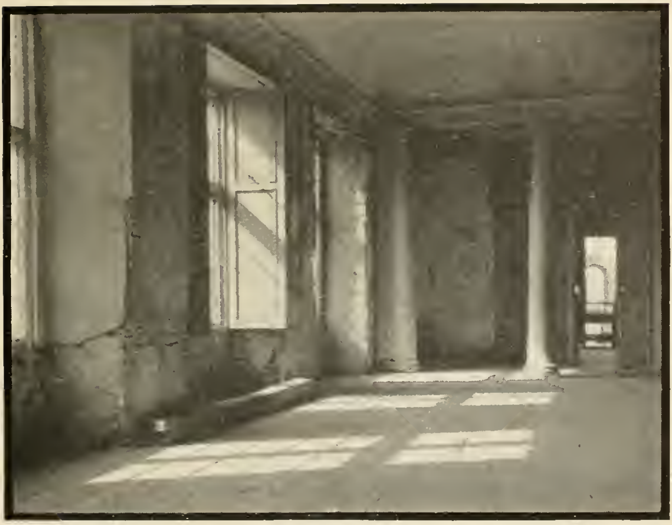
Three-Color Carbon Prints

The carbon process is one specially suited for printing in colors, since by it the image is formed by a pigment; and a pigment can be chosen "for color" much more exactly than a color can be produced by toning the image of a photographic print.

A difficulty common to all methods of making three-color paper prints, is to avoid distorting the separate prints; different degrees of contraction of the prints prevent exact register of the three images.

With 3-Color Pigment Films

One method of avoiding this difficulty is to apply the mixture of gelatine and pigment (the coating of carbon tissue) not to paper, but to thin celluloid. These film tissues



Sunshine
By Ernest Claypole

A Kid
By F. C. Baker

are sensitized in the usual way with potassium bichromate solution, and exposed under the respective negative, the plain side of the celluloid against the negative. The celluloid is so thin as not to affect the definition, and the exposed films may thus be developed without reversing them upon a fresh support, since the most insoluble parts of the exposed coating are next to the celluloid, the soluble parts are on the surface and dissolve out freely in the hot developing water.

Another advantage of celluloid as the basis of the gelatine-pigment coating is that the three developed pictures (red, blue and yellow) can be laid wet, one on the other, on a sheet of opal, and a fairly good idea be thus obtained of the final result. To assemble them permanently, they are mounted in succession on a piece of specially smooth white paper, prepared so that it expands very little when wetted and contracts to an equally small extent on drying. Usually the yellow print is applied first, as it is the least transparent color. The celluloid print and the paper support, both wet, are squeegeed together, left under pressure for a short time, and then allowed to dry slowly. Then the celluloid support is stripped off, and the blue and then the red print applied in like manner, leaving the complete three-color print on the paper support. Exceedingly fine results have been made upon these three-color pigment films and shown at our exhibitions.

With Ordinary Carbon Tissues

In employing ordinary carbon tissues, the method is somewhat more difficult, since each print has to be transferred to a temporary support of glass for development, from which each is afterward transferred to the final paper support by aid of hydrofluoric acid.

Clifton's Improvement

A notable improvement in the carbon process for three-color printing has been made (and patented) by Mr. Edgar Clifton, who prepares a special blue tissue containing, in addition to the blue pigment, some dark opaque material, which prevents the "printing through" of the tissue during exposure and can afterward be removed, leaving the blue pigment only. Thus, dark-brown manganese dioxide is added, and prevents the too rapid penetration of the light through the blue tissue, whilst it can be removed by a bath of sulphurous acid. By this modification of the process Mr. Clifton makes three-color prints which in brilliance and true color rendering are the finest I have ever known to be produced.

Ozobrome Three-color Prints

The Ozobrome method of making carbon prints has also been applied with much success to preparing three-color pictures. In Ozobrome, let me remind the reader, a carbon print is prepared by contact without action of light, by soaking the carbon tissue in a solution (containing chiefly bichromate, bromide and ferricyanide), and then placing it film to film with a bromide print for a few minutes. The carbon tissue thus acquires an invisible image, just as it would by exposure to light under a negative; but the method has the advantages of requiring no daylight from first to last, and of requiring (for large prints) only a bromide enlargement, instead of the more difficultly made enlarged negative.

The Raydex Process

As applied to three-color printing, the process is now put forward as the "Raydex," by Mr. Samuel Manners, of 71 Lavender Hill, London, England. Good bromide prints are made from the negatives of the redness, greenness and blueness in the subject. These prints are brought into contact with the respective color tissue, which has been soaked for a short time immediately before use in a special bath, presumably of bichromate, ferricyanide and bromide. After contact for some minutes, the color tissues are separated from the bromide prints, and now bear an image like a carbon print. They are placed on glasses (thinly coated with insoluble gelatine) for development in hot water.

They are now ready for superimposition to form the color print. To do this, a temporary support is squeegeed down on the blue print and the two left to dry. On soaking in weak hydrofluoric acid, the paper of the blue image is stripped away, leaving the latter on the temporary support, This blue print is then applied in register to the red print, and the paper support of the latter stripped away by the same means. Similarly, the yellow print is laid in register on the blue-red print, and the yellow paper backing stripped off. We have now all three prints on the temporary support, and the final step is to bring this latter under water in contact with the final support, and to squeegee. After drying, the temporary support is removed in hot water, leaving the finished color-print ready for trimming and mounting.

The Pinatype Process

The only remaining process which at the present time is available in commercial form for making color prints from sets of three-color negatives is Pinatype, the invention of M. Leon Didier, and worked out largely by Dr. A. König, of the German firm of dye makers, Messrs. Meister, Lucius & Brüning.

In Pinatype, we do not assemble three separate films of gelatine or celluloid. Instead, we start with a blank sheet of gelatine-coated paper, the coating on which is caused to absorb successively yellow, red and blue images from "print-plates"—that is from negatives, the images in which are formed in soft unhardened gelatine, which absorbs a suitable dye and yields it up again to the gelatine-coated paper on contact of this latter with the "print-plate."

As in the other processes we have studied, the first step is the making of negatives recording the blueness, redness and greenness of the subject. From each of these a positive transparency is made, and behind each of the latter is exposed a plate coated with soft gelatine and sensitized with potassium bichromate. This operation gives a negative image of faint brown color. But, for pinatype purposes, this apparent negative is really a positive. The light parts consist of unhardened gelatine, which takes up the special pinatype dyes; whilst the dark parts are of gelatine (hardened by the exposure to light), which does not absorb the pinatype dye.

The result is that, when the whole plate is bathed in the dye solution, a positive dye-image is formed and, after washing out the excess of (unfixed) dye, forms the "print-plate." Once these print-plates have been made, they can be dyed and re-dyed for any required number of prints.

The actual process of making the prints consists in leaving the gelatine-coated sheet of paper for a time of from fifteen minutes to half an hour in contact, first with the blue print-plate, then with the red plate, and lastly with the yellow plate. Owing to the fact that the dye in the print-plate takes the above considerable time to transfer itself to the paper, it is easy to adjust the first image in register with the second and third print-plate, and the progress of the impression can be watched by raising one corner of the paper for an instant.

The process is thus one of the most rapid for making a number of prints of one subject. As regards their quality, pinatypes, to judge from the results shown, are somewhat deficient in intensity or depth, due, no doubt, to the lesser "body" of the dyes as compared with the pigments used in carbon printing. They are brilliant, whilst carbon prints tend to be heavy, and the difference is well seen in subjects containing dark, fully saturated colors. With subjects, however, consisting mostly of light, gay colors, pinatypes show to advantage.

Color Screen-Plates

Now we come to the most recent developments of color photography—the system which has brought the making of color transparencies within the power of even the inexperienced worker. A screen-plate is a plate which contains within itself all the means for singling out the redness, greenness and blueness of the subject, and recombining the records in conjunction with the respective colors, without any of the tedious operations of separate negatives, printings and registrations.

Du Hauron and Joly

Though a practicable screen-plate is comparatively new—the first plate appeared on the market in 1907—the principle of it dates back to 1868. I have before me a copy of the rare book "Les Couleurs en Photographie," in which Louis Ducos Du Hauron outlines practically every form of color process, the screen-plate among them. Since his day, the method has steadily advanced toward a practical stage, through the labors chiefly of Dr. Joly, of Dublin and J. W. MacDonough, of Chicago.

Lumiere and Others

It finally reached the stage of commercial practicability at the hands of the brothers A. & L. Lumière, of the dry-plate manufactory of Lyons, France. Following their issue of the autochrome plate, other variations of color screen-plate have been introduced. Numberless others have become known in patent specifications but, at the present day, the plates upon the market are limited to the Autochrome of M. M. Lumière, the Dioptichrome of M. M. Guilleminot, Boespflug & Co., Paris, and the more recent screen-plates of the Paget Prize Plate Co., Watford, England.

What is a Color Screen-Plate?

In this monograph we have followed the historical order with advantage, I believe, in forming a clear understanding of the difference between the additive and subtractive systems of color photography. Now the reader must retrace his steps to the additive system as embodied in the Ives Kromskop, since the screen-plate is upon exactly the same principle. In it the three separate records of redness, greenness, and blueness are obtained in a single plate. An ingenious chemical device is used to obtain them in positive form, although the original produces a negative.

The screen-plate consists of a fine mosaic of regular or irregular pattern, containing minute areas of red, green, and blue spaces. Upon this mosaic (prepared on a glass plate) a panchromatic emulsion is coated, with a layer of varnish to separate the two. The plate is exposed glass side toward the lens, so that the rays of light forming the image pass through the minute color filters.

The number and depth of these color-filters are so adjusted by the manufacturer that the plate as a whole is without color, the three primary colors forming white. Their structure is so fine that in the image each bit of detail is made up of patches of silver deposit, which are formed by light coming through a number of one or more of each kind of minute color-filter, red, green, or blue. Each tiny red, green, or blue filter acts in the same way as the full-size filter used in making the redness, greenness, or blueness records for, say, the Ives

Kromskop; but, instead of these records being obtained as three full-sized negatives, we obtain them (on developing the plate) in an immense number of fragments, making altogether the area of one full-size plate. The result of development is a negative, and therefore, when the plate at this stage is held up to the light, the image blocks out, more or less completely, precisely the minute patches of color which transmitted light to the sensitive image.

In other words, we see through this negative image not the patches of color which represent the dissection of the subject into red, green, blue, but the remainder of all the patches in the plate i. e. the complementary or negative colors. Clearly it is these last which we want to block out, and the former which we want to lay bare, in order to obtain a record in color of the original subject.

There is a very simple chemical method of doing this. The developed plate (unfixed) is placed in a solution which dissolves away the negative silver image, but leaves untouched the remainder of the silver bromide in the plate. This so-called "reversing" solution consists of permanganate or bichromate of potash, with an acid.

Its effect is to lay bare the color elements which formed the negative image, leaving the other color units only half covered by the white silver bromide. But this latter is converted into an effective mask by giving the plate a short exposure to light and applying a developer.

We have, in short, converted the negative image into a positive one. Each tiny area of this latter tells what amount of redness, greenness, or blueness there was in the subject but, since each is backed by the color element through which the exposure was made, it does more—it shows the redness, greenness, and blueness in separate patches, which are so small that the eye cannot perceive them, and the plate appears a transparency in the colors of the subject.

Mr. Salt's Diagram

Perhaps the stages in the production of the color effects in a screen-plate transparency may be made clearer in the form of diagrams, such as those drawn some years ago by Mr. E. A. Salt, which I am fortunately able to utilize. They represent, on a tremendously exaggerated

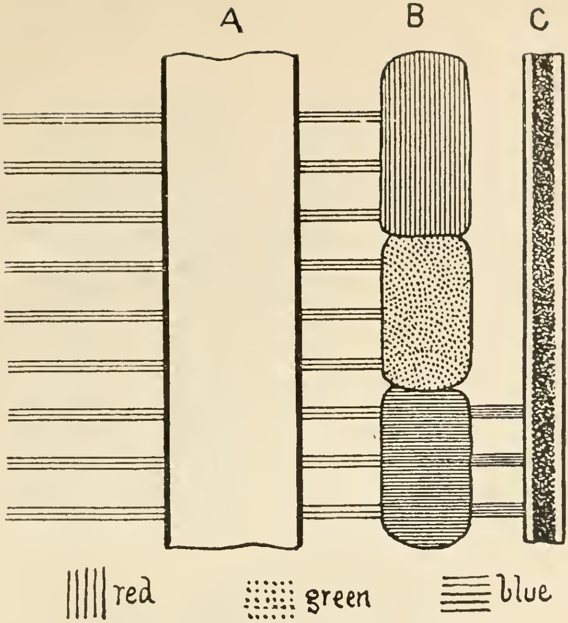


FIG. 2

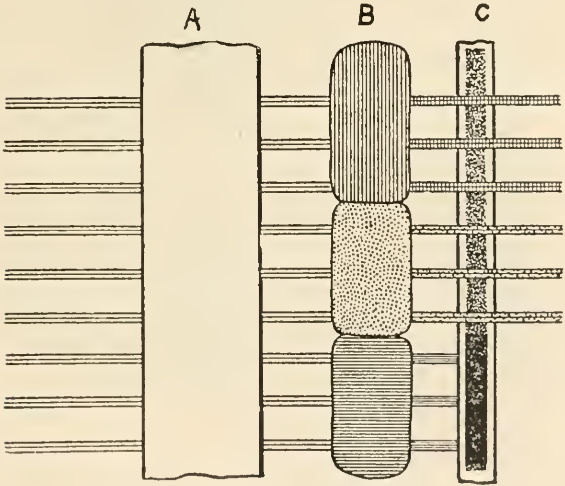


FIG. 3

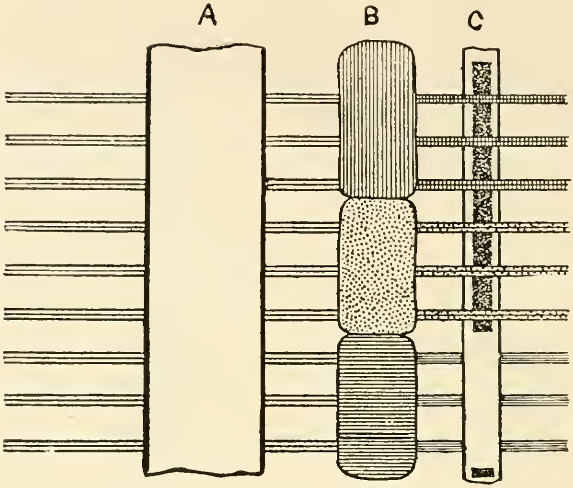


Fig. 4

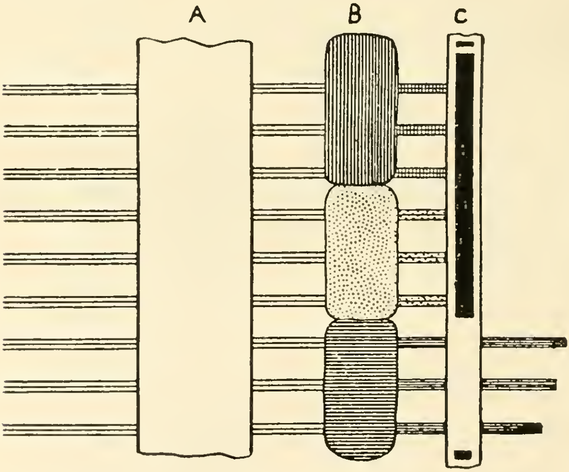


Fig. 5

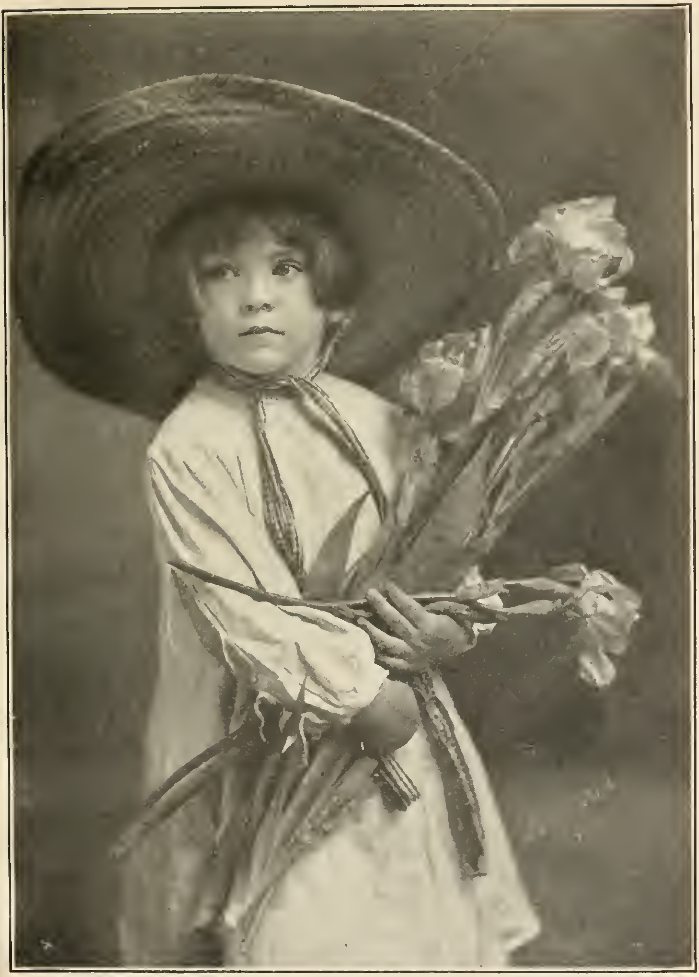
scale, the stages in the recording of a minute blue object on a screen-plate. Mr. Salt's diagrams are shown in Figs. 2, 3, 4, 5. In all the figures, *A* is the glass-plate, *B* the layer of minute color filters, and *C* the sensitive emulsion film. Red is denoted by |||||, blue by ≡, and green by .... Fig. 2 is exposure. The rays of light (blue) from the blue object pass through the blue grain and reach the plate, but are stopped by the red and green grains. In Fig. 3, the plate has been developed, and is being viewed by transmitted light. The black silver deposit under the blue patch blocks out the light, but the red and green grains allow light of these respective colors to pass to a considerable extent, producing by that mixture, yellow, that is the complementary of red. In Fig. 4, the negative image has been removed in the reversing bath. Light now passes freely through the blue grain; less so, through the red and green grains, owing to the emulsion film over them. Result,—a weak positive image (in color) of the blue object. In Fig. 5, the emulsion left after reversal has been exposed to light and darkened by a developer, and now stops light from the red and green grains, leaving only the blue grains illuminated when the plate is viewed by transmitted light. Result,—full blue image of the blue object.

We must bear in mind that what is true for one grain is true for all, and also that it is true for compound as well as for pure colors in the subject. Usually, natural subjects emit rays which pass in various proportions through all three sets of units—red, green, and blue. In the treatment of the screen plate, the color units through which the light passed first have a negative image formed over them, whilst the other units remain more or less uncovered. Reversal and the second development cover these latter more or less completely, and (also, more or less completely) uncover the image-forming units. Having now studied the principle of the screen plate and of its manipulation, we can pass to the various forms in which it is available for practical use; in doing which we shall come upon a variation of its method which is of practical interest.

The Autochrome Plate The method of M. M. Lumière for preparing the fine mosaic film of color-filters is a very ingenious one. The basis of it is a particular form of pure starch, sifted so that the grains are, roughly, not larger than .020 of a millimetre (1-1200 inch) and not smaller than .015 of a millimetre (1-1700 inch) in diameter. Starch of this minute size of grain is dyed—separate lots of it—red, green, and blue. These dyed powders are then compounded to make a mixture which is practically neutral in color—free from any predominant tint. The mixture is dusted on glass plates coated with a sticky substance.

The grains being round, it is inevitable that there are uncovered spaces. These are filled up by dusting over fine lampblack which adheres to the uncovered (sticky) spaces on the plate. Next, the plate is rolled and then coated with a varnish, upon which latter the panchromatic emulsion is coated. Since the emulsion cannot be made equally sensitive to the red, green, and blue rays, coming through each set of grains of these colors, it is necessary to reduce the intensity of those most active (the blue) toward the emulsion by means of a yellow screen on the lens. Such a compensating light-filter is necessary for every commercial screen plate, so that the light is reduced by passing both through it and through the mosaic color-film on the plate. Hence the working speed of a color plate is small, about 2 on the Watkins meter in the case of the Autochrome. The exposure of an average near subject in brightest summer light with *f*/6 stop in the lens is about one second. In flashlight Autochrome work specially prepared flash powders, such as the Panchroma and Agfa powders permit of much shorter exposures.

Development Simplified The processes of the development, etc., of the plate have been greatly simplified since its first introduction. The same solution may be used for the first and second development, viz.: One part of the stock solution given below mixed with four parts water. *Stock Solution.*—Metoquinone (quinomet), ½ ounce (15 gms.); soda sulphite (anhydrous), 3 ounces (100 gms.); ammonia,



Childhood
By Belle Johnson

All Ready for the Picnic
By Belle Johnson

.920, 9 drams (32 ccs.); potass bromide, 90 grains (6 gms.); water, distilled, 35 ounces (1,000 ccs.). In this the plate, if correctly exposed, is fully developed in two and one-half minutes. For exposures which may not be correct, development is begun in a much weaker solution. According as the time taken for the image to appear is longer or shorter, more or less of the stock solution is added; the total time of development being likewise prolonged according as the image is longer in making its appearances.

Reversing the Image

When fully developed, the plate is rinsed for a second or two, and placed in the reversing bath of: Potass permanganate, 30 grains; sulphuric acid, 3 drams; water, 1 ounce. As soon as it is covered by this bath, it can be handled for the rest of the process in daylight. In three or four minutes the negative-developed image is dissolved away by the reverser. The plate is washed for half a minute and developed for a second time. The bath already used may be employed and, after development for three or four minutes, the plate ordinarily requires no further treatment than washing for three or four minutes in running water.

Intensification

If it is to be intensified, it is best to pass it through a fixing bath, afterward washing it for five or ten minutes. Many of the best workers avoid intensification as prejudicial to the best results; but, where intensification is done, the be best method is the so-called "acid-silver." A freshly prepared mixture of pyro, citric acid and silver nitrate is applied to the plate and gradually adds silver to that already forming the positive image, after which the plate is cleared in a weak bath of permanganate and again fixed.

Thus the whole process of completing the color transparency does not take more than twenty minutes or half an hour. Finally, the plate is dried, which it does very quickly owing to the thinness of the emulsion film, and varnished, best with a thick solution of celluloid in amylacetate, not with a spirit varnish, which attacks the varnish covering the color film. Such, in brief, is the treatment of the Autochrome plate. The handbook of instruction issued by the Lumière-Jougla Co., in America, and by Mr. T. K. Grant, in Great Britain, contains the full formulæ and directions for their use, which should be carefully followed.

The Dioptichrome Plate

Unlike the Autochrome, the color mosaic in this plate is of regular geometrical pattern. It is prepared by a photographic process invented by M. L. Dufay. The starting point of the process is a negative or grating of alternating opaque and transparent bands, the former half the width of the latter. A glass plate is coated with bichromated gelatine and exposed behind the grating, so as to form bands of insoluble hardened gelatine where light has passed through the transparent lines of the grating. The plate is given a bath in, say, the red dye which stains the soluble bands of gelatine. It is then worked up with greasy ink, which adheres to the bands of insoluble gelatine. This plate is then pressed in contact with a glass plate coated with plain gelatine, whereby the bands of greasy ink are transferred to the surface of this second plate (the screen plate), and the dye in the narrow bands penetrates into the gelatine.

We have thus a series of bands of red dye covering one-third the area of the plate, whilst the remaining two-thirds is covered with opaque bands of greasy ink. Before these latter have completely dried, a varnish which is repelled by the ink is applied, and protects the dye line. The ink is then removed with a suitable solvent, leaving one-third of the plate occupied by varnish-protected red bands. A second bichromate printing is now done, and the above operations carried out, but this time with a blue dye, giving one-third blue bands over plate No. 2. Finally, plate No. 2 is given a bath of green dye, which fills in all the interspaces with this color.

The Dioptichrome plate is treated, as regards exposure and development, on exactly the same lines as the Autochrome. The difference is one of details. For the Dioptichrome, a solution of bichromate and acid is preferred as the reverser, and of mercury bichloride, followed by sulphite, as the intensifier. In perfection of color-rendering the Dioptichrome, judging by the examples shown by individual workers at exhibitions, is not quite the equal of the Autochrome. It is, however, more transparent than the Autochrome, as the dyes in the mosaic color-films have no vehicle such as starch to add to their capacity. Moreover, the Dioptichrome color-film is less liable to damage by heat than is the starch coating of the Autochrome.

Duplicate Color Transparencies

When using either the Autochrome or the Dioptichrome plate, the result of an exposure is one transparency in colors. If duplicates are to be made, the method is to photograph this first transparency on to a second color-plate, treating this latter exactly like one exposed on a natural subject.

In doing this, there is always a certain loss of brilliance; the colors in the copy are somewhat degraded or mixed with black. That such degradation is inevitable when one screen-plate is printed from another by contact, was first pointed out, on theoretical grounds, by Dr. Kenneth Mees; but in practice the loss of brilliance is much less than theory would indicate. The diffusion of light from the grains of the color-transparency which is being copied counteracts to a considerable extent the blocking-out of grains of one color by those of others, which is the cause of the blackening of colors in the copy. In the case of strong originals of full, bright colors, the loss is not of importance; and in all cases it is lessened by making the copy (in the camera) on a smaller scale.

The screen-plate process may, however, take a form in which any number of color transparencies may be made as the result of one exposure, without incurring the drawbacks of copying from one screen-plate onto another. In fact, this was the form of the first screen-plates issued commercially—those of Dr. Joly, in Ireland, and of MacDonough, of Chicago. In these, the color-screen (which ran in bands) and the sensitive plate were separate, and were pressed together film to film at the time of exposure. Then the plate was developed to a negative, and an ordinary positive transparency printed from it by contact. This positive corresponds with that obtained by chemical reversal in the Autochrome process. It was placed film to film in register with a color-screen (viewing screen) of the same pattern as that (taking screen) through which the exposure was made. That is, the red bands of the screen were placed in register with the bands in the positive recording the redness; the other colors were then necessarily in register also. Such registration is easily done. The relative position of the two glasses is adjusted by minute shifts and twists until the known color of some part of the subject is seen to be correct, when the other parts must be equally correct. The two are thus bound together with paper strips.

Obviously, any number of positive transparencies can be made and bound up in register with identical viewing screens, and the method has other advantages.

Against these advantages are several drawbacks. Care is needed in insuring intimate contact between the taking-screen and the sensitive plate, when making the exposure in the camera. The larger the plate the greater the difficulty, since glass plates, unless optically worked, are not perfectly flat.

Secondly, the finished color transparency shows the correct colors only when viewed "dead on."

Viewed sidewise, the colors change because, instead of looking through a given band or patch in the positive transparency at the band or patch of color which corresponds with it, we see that (of another color) to the right or left.

No color transparency of separate glasses can avoid this defect of "parallax," and the evil of it is greater, the finer the pattern of the screen-plate. Such color transparencies are quite satisfactory for projection in an optical lantern where the light passes straight through them, but when viewed in the ordinary way they show chameleon-like changes of color with every different angle. Still, a chief use—one might almost say *the* chief use—of color transparencies is as lantern-slides, and, therefore, it is satisfactory to find one maker issuing a screen-plate in this form.

The Paget Screen-Plate

The Paget Plate Company, of Watford, England, manufacture a screen-plate, by a patented method of their own, which secures very great transparency. This screen-plate is supplied for use in three forms: 1. Emulsion-coated, for the production of one color transparency per exposure by a reversing method, such as that adopted for the autochrome plate. 2. Separate, for exposures on a panchromatic plate in contact, and the printing, from the negative, of positive transparencies, which are bound up in register with color-viewing screens; and 3, separate, as 2, so far as the taking-screens are concerned, but with the viewing-screens coated with a special transparency positive emulsion, by which any number of color transparencies may be made free from the defect of parallax. Supplies for these methods can be had in America from the Herbert & Huesgen Company, New York.

The First Method

To the first of these processes it is not necessary to refer at length; the manipulation is similar to that of the Autochrome plate.

The Second Method

The second embodies the virtues of the Joly and Macdonough processes in an improved and practical form. The color-screen is of chess-board pattern, and of such fineness (each square about 1-400 of an inch) that a lantern picture of 12 feet or 15 feet shows no sign of pattern at a comfortable viewing distance. As regards shortness of exposure, any separate method is at a great advantage. As explained earlier in this monograph, in making the record of the redness, greenness, and blueness in a subject, the color-filters should (between the three of them) pass all rays from red to violet; whilst, for supplying the positive transparencies with color, filters passing strictly red, green, and blue should be used. Clearly in an emulsion-coated screen-plate, where the colors in the pattern have to serve both for taking and viewing, a compromise has to be made; but when separate screens are used, those for taking may be lighter, because they may be permitted to transmit a broader band of color, and therefore allow of shorter exposures.

Thus, in the Paget separate or duplicating method exposures may be as short as one-fourth second with a lens working at f/8 in bright sunshine. The working speed of the Paget panchromatic plate exposed through the screen-plate, and with the correcting light-filter on the lens, is given as 15 Watkins. The plate is developed for about two minutes in 1:20 rodinal. A positive transparency is printed from the negative and developed; so as to give a good, black, vigorous image. The registration of this transparency with the viewing screen is a simple operation which, after some practice, can be done in a few seconds.

Paget Non-Parallax Color-Plates

I must devote a few words to a description of this ingenious method, although the material itself, at the time of writing (August, 1913), is not yet on the market. I have, however, witnessed the system in use in the factory of the Paget Company.

As already stated, this third form of the Paget color-process is based on the use of a viewing-screen coated with a special transparent gas-light emulsion. The positive transparency from the negative exposed through the taking-screen is made on this emulsion. But, before printing, the viewing-screen must of course be placed in register with the negative. When so placed, it shows not the natural colors of the subject, but the complementary colors; and it is manifestly very difficult for the worker to be sure that the adjustment is correct.

One cannot expect the cultivation of a color-sense which will be a safe guide amid the strange effects which result from greenish blue instead of red, blue instead of orange, and greenish yellow instead of violet.

The Paget Company provide a simple means of getting over this difficulty. On the two ends of each taking-screen they impress some lettering in a color which sharply cuts out one of the three colors of the screen; e.g., a blue impression which cuts out the red. Thus, on exposure in the camera, the negative registers the complementary color, viz., red. When registering the emulsion-coated viewing-screen with this negative, the correctness of register is known by the appearance of this lettering in red. When this is seen to be the case—the adjustment is made by weak white light—the negative and emulsion-coated viewing-screen are clipped together, exposure made through the negative, and the image developed and fixed. The color-transparency so obtained is free from the parallax defect of one composed of separate positive and viewing-screen, and does not display the astonishing changes of color with different angles of view.

In these two "duplicating" forms of the Paget screen-plate, the manipulations are almost the same as those of ordinary photography. The results are extremely fine in both color-rendering and transparency, whilst the gelatine film of the plate on a substratum of dyed collodion is as immune to damage by heat in a lantern as an ordinary stereopticon slide.

Other Screen-Plates

The reader interested in the whole story of color screen-plates must look into patent specifications. There are plenty for his study. The plates which have materalized on the market are very few, for between the invention of a method of making a screen-plate and the commercial working of it there is a great gulf which requires more than ordinary technical skill to bridge. Here I have written only of what is open to the practical worker to use. Though the processes are few, there is ample opportunity for interesting work; and it is not rash to prophesy that further developments in screen-plate color photography will make their appearance in commercial form during the next year or two.

Bleach-Out Color Prints

It is no disparagement of the superbly beautiful results of the color-screen plates to say that they fail to provide the ideal result. Apart from the lantern, a glass transparency is an awkward thing, fragile and not easily shown properly except in a special viewing-box. What photographers want is a process of making color prints on paper of a degree of simplicity akin to the production of a screen-plate color transparency. So far they have asked in vain for such a method.

Smith's Utocolor

The only answer, up to the present, is the method of one-exposure color printing depending on the bleaching out of dyes, and owing its development to its present stage to Dr. J. H. Smith. The commercial paper is known as "Utocolor," and is manufactured by a firm of this name at St. Garennes des Colambes, Paris. In America the supplies for the process are obtainable from J. L. Lewis, New York.

In principle the process is most simple. When exposed to light under a colored original, the bleach-out paper yields a copy more or less true in color-rendering. The paper is coated with a mixture of three dyes, red, yellow and blue, which are bleached by light; the proportions being adjusted to yield a black film. The film is black because the three dyes severally absorb the whole of the light reflected from the paper support. But if one or more of them is bleached by exposure to light, color is produced; since the light from the paper is not now wholly absorbed, but appears of a color due to light transmitted by the dyes which have remained unaltered.

The formation of colors follows the laws of the subtractive process we have considered in the early part of this book. The black paper is exposed to light under a transparency in natural colors, e. g., a colored lantern-slide or Autochrome transparency. How then is it that the dyes are bleached so as to reproduce the colors of the original? Well, the bleaching is a chemical change, and light of a given color acts only upon the dyes which absorb it. From what we have learned of the nature of color, we shall understand that, in the case of red rays for example (light coming through a red part of the original), they are not absorbed, but reflected by the red dye in the paper. The blue and yellow dyes absorb them and are bleached, whilst the red dye remains intact. The same thing holds good for the other colors, and thus the colors of the original are reproduced in the bleach-out print.

In practice, there are a number of obstacles in the way of this process. Dyes of themselves bleach far too slowly, and have to be mixed with sensitizers which render them more fugitive; and it is not easy to make all three sensitized dyes bleach at the same rate. Then, during the long exposure to sunshine, the film of an Autochrome is liable to suffer from the heat. Despite these difficulties, Dr. Smith has succeeded in bringing the paper to a stage at which it is possible to make presentable color-prints from screen-plate transparencies.

It may be hoped that, with further investigation, the time of printing will be reduced and the quality of the color-rendering improved.

The Lippmann Process

No book professing to treat of color photography would be complete without a description of the process of M. Gabriel Lippmann, although it is now scarcely practised, and does not yield what most people would call a color photograph. The principle of it is totally distinct from the three-color methods we have been considering. The Lippmann color photograph is not formed by dyes. It is an optical effect of the same nature as the colors in a soap-bubble or mother-of-pearl. The soap film itself is colorless ; so is the substance of mother-of-pearl. The colors come from the structure of the material in each case. In the Lippmann process, this color-producing structure is formed in a transparent sensitive film. It is the image of the subject photographed, but, instead of being placed, as in the case of most photographic images, on or near the surface of the film, it is formed in a series of layers, the placing of these layers being conditioned by the color of each minute separate part of the image. When the plate is illuminated in a particular way, these layers of developed image reproduce the rays of the color which formed each. How the image is formed, and how it yields the color-effects, are not easy matters to explain. Those who can refer to the printed report of M. Lippmann's lecture before the Royal Photographic Society, in 1897 (published in the Journal of the Society), will find therein the clearest description of the process available.

In practice, the process requires a perfectly transparent emulsion-film color, sensitized to all rays, Such a plate is necessarily very slow. It is exposed in a dark slide made to hold mercury in contact with the film. The exposure for a landscape subject will be a minute or more. The plate is developed, fixed, and, usually, intensified, and is then ready for examination in a viewing-chamber, or it may be projected by reflected light upon a screen. Of late years, Messrs. Carl Zeiss have designed and made improved apparatus for the exposure, viewing, and projection of Lippmann plates; nevertheless, the process remains very little more than a beautiful scientific experiment.

Polychromide

In the Polychromide process, a set of color-separation negatives is made in a special camera which gives the three records with one exposure. This camera carries an optically flat red screen, set at an angle of 45°, which is mirrored on the front surface so as to reflect white light to plate-holders at the side of the camera, carrying the blue and green sensation plates placed film to film, and allowing the red rays to pass through to the red sensation plate at the back of the camera. The final color print is secured by making a base print on a special developing paper, which is bleached and toned yellow. Over this is superimposed a red carbon image from the green sensation plate, and then a transferotype, blue-toned print from the red sensation plate, producing a print giving the subject in its natural coloring.

Cinematography in Colors

In conclusion, a reference may be made to the production of animated photographs in colors. Many cinematograph films are colored by hand or machine, but of late several processes of producing the color effects solely by color-photographic methods have been worked out, and many others have been patented.

Broadly, such processes are applications of the additive color method (of the Ives Kromskop) to moving film. When exposing, a disc containing the requisite color-filters in sections is rotated on the lens-hood, geared to allow light to pass when the film is stationary for exposure. Similarly, the projection lantern is fitted with a similar shutter which provides the colors for the positive picture film.

Kinemacolor

In one process, "Kinemacolor," worked out by Mr. G. Albert Smith, only two filters are used for taking and projecting, one reddish orange and the other bluish green; and considering this departure from theory, the process yields exceedingly good results. Other inventors have placed the color-filter on the film itself or on another film run through with it, whilst others are turning to Pinatype and similar processes for preparing complete three-color cinematograph films; with what results cannot be said, since their aims are disclosed only in patent specifications of the last year or two.

Gaumont's Color Films

The Gaumont Company has however, worked out a three-color moving picture on the additive system, which has shown itself capable of projections of remarkable beauty and fidelity of color-rendering. By the Gaumont process of making motion pictures in color, the negatives are taken on a Panchromatic film through three lenses working simultaneously in making three images on this film. One of these lenses is screened with violet blue, one with green and one with red. From these Panchromatic negatives, prints are made in the regular way on a positive film, and are projected, three at one time, through three separate lenses and three separate color screens, the images being superimposed on the curtain, giving full natural color.

It will be noted that this color process differs from other motion-picture color processes in that, if the operation of the projecting machine be stopped, the stationary picture then shown on the screen is in full color, this process not depending upon the deception of the eye by the rapid substitution of one color for another. As this method is said to have been purchased by the Eastman Kodak Company, its results will doubtless be familiar to American readers before many months have elapsed.

With this, our brief survey of color photography to date must end. Many inventors are still working enthusiastically on the methods mentioned herein, to simplify them and bring them to greater perfection. Others are hard at work on new methods, of which we have yet to hear.

GEORGE E. BROWN.

Notes and Comment

Our special offer of a copy of Dow's "Composition," together with THE PHOTO-MINIATURE for a year, both postfree, for $5 (which effects a saving of $1.72) is being widely taken up by new and old readers of THE PHOTO-MINIATURE. Apart altogether from the value of the magazine, the chance to get a copy of Mr. Dow's book at $2.50, instead of $4.22, is one of those opportunities which come but seldom. No reader of THE PHOTO-MINIATURE can afford to be without Mr. Dow's help in his picture-making so long as this remarkable offer is open. We suggest prompt action, as the offer may be withdrawn at any time.

With the exception of a little English book by E. Lindsay Johnson, this number of THE PHOTO-MINIATURE is the only handbook in English to the absorbingly interesting field of color photography. Our readers are to be congratulated upon the excellent résumé of the processes given in this number, from the pen of the editor of the "British Journal of Photography," Mr. George E. Brown, who is probably more thoroughly conversant with the present development of photography in colors than any other living writer. As the editor of the "B. J," Mr. Brown, has for some years issued with the "B. J." a special supplement wholly devoted to color photography. Those who seek details about the processes described in this number of the "P-M." can find all the information they desire in the files of the B. J. "Color Photography Supplement" for the past three or four years.

The Boston Convention of the Photographers' Association of New England gave me an enjoyable two days' holiday during the week beginning September 2. The New England Convention always brings together a group of people worth knowing, and during my visit there I met many old acquaintances. Among these were J. H. Garo, Francis J. Place, W. H. Partridge, George H. Hastings, G. Cramer, Pirie McDonald, Morris B. Parkinson, George E. Tingley, J. C. Bushong, and others whose names I cannot recall, but whose work in photography has been known and admired for many years past. The Convention itself hardly realized my expectations in interest or scope. Apparently, the New England Association has lost the active coöperation of many of its members. This is lamentable, and I hope that another year will see a revival of the old-time glories. In a day not long past, the Boston Convention was second only in interest and importance to the National Convention—as it should be.

The illustrated lectures on "Commercial Photography," "How to Figure Profits and Overhead Expenses," and "Perfect Success," by Juan C. Abel, were crowded and excited a great deal of enthusiasm. "Daddy" Lively came from Tennessee to give demonstrations of home portraiture, and his instruction was keenly appreciated. It is evident that "Home Portraiture" is being widely specialized by professionals, who are finding in this field an unsuspected gold mine. Mr. Charles Hetherington, formerly of Chicago, and at one time noted for his splendid portraiture, surprised all his old-time friends by suddenly appearing at the Convention, after being lost sight of for years. According to his present plans, he intends to pursue home portraiture through the southern states during the coming year, working upon a plan which enlists the active coöperation of the local photographers.

The exhibition of photographs held in connection with the Convention was disappointing. The general impression given by the show, which I examined very carefully, was that photographers have become confused by overmuch novelty in ideals. There was a conspicuous lack of the good old-fashioned qualities which are as essential in portraiture today as they were fifty years ago, viz.: The pleasing arrangement of the subject in the picture space, a real knowledge of the principles of lighting the subject as applied in portraiture, and discrimination in the matter of printing papers and printing methods. The gold medal in the "Grand Portrait Class," which was open to the world, was awarded to a very ordinary piece of portraiture, by N. C. Brock, of Asheville, N. C. The Wollensak trophy cup, offered by the Wollensak Optical Company for the best portrait made with Wollensak lenses, was secured by Mr. W. H. Partridge, of Boston. Special features of the exhibition were a loan exhibit by the Boston Photo-Clan, and an unusually large collection of autochromes by many different workers. Of the latter collection, possibly three or four were praiseworthy in fidelity and quality of coloring; the majority of the exhibits being weak in color and hardly comparable to a really good hand-colored transparency. In the exhibit of the Photo-Clan, there were perhaps half a dozen passable examples of pictorial photography; but the majority of the exhibits showed a strange lack of reasonableness in the treatment of the subject. Certainly, the average of the work shown was by no means comparable with the work seen at the larger amateur exhibitions held during the past few years. Evidently, the members of the Photo-Clan need direction in their work. The hint, here given, that fuzziness is not necessarily art, will help those who can take the hint in goodwill and reform their pictorial methods.

The manufacturers' section, though not large, was very interesting. The G. Cramer Dry Plate Co., of St. Louis, showed a splendid collection of portraiture made upon Cramer plates, together with an illuminated display of negatives and transparencies, which offered much practical instruction to the photographer. The Hammer Dry Plate Co,, of St. Louis, had a similar exhibit, which attracted many visitors. The widespread popularity of the Cramer and Hammer plates among the professional photographers is bound to increase so long as these products maintain their present high standard of excellence. The Eastman Kodak Co. and the Ansco Co. were both represented by complete exhibits of their specialties, the new Eastman Portrait

Film attracting a great deal of attention as the outstanding novelty of the year. The Paget color processes, which are described in this issue (Herbert & Huesgen Co., New York), were demonstrated by Mr. Hanks, and the exhibit of Paget color transparencies, though small, was promising. The exhibit which attracted the biggest crowd and the largest interest was the demonstration of coloring photographs with Assur colors, made by Schering & Glatz, of New York. This is a new and practical process for coloring photographs, the colors being transparent, light-proof and air-proof, incorporated in a specially prepared base, which does not penetrate and injure the print. The method of applying the colors is exceedingly simple; they are strong, brilliant, and dry quickly; large surfaces can be covered uniformily and effectively, the correction of any errors or any changes desired being quickly effected. Readers who have found difficulty in the use of other methods of coloring photographs will do well to send to Schering & Glatz for the Assur booklet, which gives full details of the method and its advantages.

Another interesting novelty was the Eagle home-portrait and studio lamp, shown at the booth of George Murphy, Inc., of New York. This is a remarkably compact lamp of high efficiency, ideal for home portraiture, or for many uses in commercial photography. It can be attached to any electric-light socket, and will work on either direct or alternating current, the apparatus being collapsible and portable, fitting into a small dress-suit case. Those who have use for such a lamp will do well to write to the makers for the descriptive circular, which gives full particulars.

The growth of the business of the Ansco Company in the Northwest is shown by the fact that, although the Minneapolis branch of the Company equipped large quarters in that city only two years ago, they have now been obliged to lease still larger premises in the Commercial Building, First Avenue North and Third Street. Orders should be mailed to the new address, to avoid delay.

Everything is running to color, these days! The art shops are full of color prints, and the perfection of the various color-printing processes is rapidly bringing a lot of very attractive pictorial work within the reach of the man of moderate means. Photographers, too, are awakening to the possibilities of color as a means of adding to the attractiveness of their work. The professional is enthusiastic about Assur colors, as giving him what he needs for his portraits and rough papers. The amateur will find in Aristotint an outfit which will give him a ready means of coloring his prints. The Aristotint outfit is a set of eight colors, with complete working directions, at $1. It is made by L. M. Prince, 108 West 4th St., Cincinnati, who backs his product with the guarantee of "Money back if not satisfied." We suggest a trial of Aristotint for some of the summer pictures.

At 235 Fifth Avenue, New York, the visitor to the metropolis who cares to investigate will find a studio which is probably unique among the portrait studios of the world. This is the Allison Studio, where the exuberant enthusiasm of Mr. J. W. Allison, in years past a notable worker in amateur photography, is finding expression in the doing of hitherto impossible things by means of color photography. The Allison Studio is equipped for color photography only. Its furnishings and decorative features are all of the most dainty description, with a wealth of color and color harmonies on every side. The exposures in this studio are made by means of the Panchroma Flash Powder, the invention of Messrs. Allison & Hadaway, and which cuts down the exposure usually required by the autochrome plate very considerably. An example of the color portraiture of the Allison Studio is seen in the frontispiece of this number, the exposure for which was 1-30 sec., with the lens working at f/6.3. Panchroma Flash Powder not only reduces the exposure and makes instantaneous color photography possible, but it gives perfect color rendering in the flesh tones, as well as in the reproduction of the more difficult colors, such as royal purple.

Attractive as our frontispiece is, it will not bear comparison with the exquisite beauty of the original autochrome from which our color plates were made.

There is a great future before those who, like Mr. Allison and his associate, Mr. Hadaway, devote their attention to the possibilities of reproducing color. As an example of how far the Allison Studio has developed its system, we may mention that, at the recent Tiffany Fancy Dress Ball, Mr. Allison made sixty-six autochrome portraits and portrait groups within two hours, with only two failures. This was a remarkable record both as to the number of exposures and the fewness of the failures, and speaks volumes for the quality of Panchroma Flash Powder.

The development of color photography for the reproduction of textiles, stuffs, color designs, and all other commercial objects wherein color is the all-important feature, is as interesting as its application to portraiture; and we understand that the Allison Studio is busied with much work of this kind, especially in the reproduction of Paris models, window displays, and other details of publicity schemes. In short, the work of the Allison Studio is an eye-opener to those who are only familiar with photography in monochrome, and its activities bid fair to change the face of photography as we have known it in the past.

The popularity of flashlight Autochrome work has largely increased since the Agfa people introduced their Agfa Flash Powder, which considerably reduces the exposure required with the Autochrome plate and ordinary flash powders. Those who have not yet tried Agfa flash powder for this work will be pleased with the results on a comparative test.

Books and Prints

All books noticed in these pages may be obtained from the publishers of THE PHOTO-MINIATURE, and will be promptly forwarded, postpaid, to any address on receipt of the publishers' prices as here quoted.

The A B C of Artistic Photography: By A. J. Anderson; 344 pages; with 16 illustrations, including several photogravures. Cloth, gilt, net $2.50; postage, 15 cents extra.

This is a new and cheaper edition of "The Artistic Side of Photography," which, upon its publication a year or two ago, we characterized as one of the cleverest books extant dealing with its particular field. It is sufficient, therefore, to announce the publication of this new edition without substantial alteration in the text. "The A B C of Artistic Photography" is emphatically a book to buy and read and read again, being nothing more or less than the ripe, well-digested and interestingly expressed thoughts of a practical worker in photography, whose work was touched with unusually fine and high ideals. The simplicity and directness of his instruction will appeal not only to amateurs but to advanced workers in the profession. Although written from the artist's point of view, Mr. Anderson has managed to get into his book a large amount of practical, technical information about the different processes, and the volume is bound to inform and reform the mind of the intelligent reader. New York. Tennant and Ward.

The Art of the Wallace Collection: Including an Account of Its Founders, a Description of the Pictures and a Survey of the Chief Exhibits in the Galleries devoted to Objects of Art and Arms and Armor. By

Henry C. Shelley; 347 pages; with 48 full page duogravures. 12mo. Net, $2. Boston. L. C. Page & Co.

Mr. Shelley is already fairly well known by his interesting guide to "The British Museum and Its Treasures." In the volume under notice he gives us a comprehensive survey of the wonderful collection of pictures and works of art gathered together by Lord Hertford and Sir Richard Wallace, to be seen at Hertford House, where the collection is permanently open to the public as one of the national galleries.

Among the art galleries of London, there is none held in higher esteem, by "the man in the street" as well as by the connoisseur, than this Wallace collection. Its interest and charm are in large measure due to the wide range of its variety. It affords the student an opportunity to study the modern as well as the older masters; and in the eighteen galleries devoted to the collection some are given up to furniture, bronzes, marbles, porcelains and arms and armor, the latter collection being remarkable for its completeness.

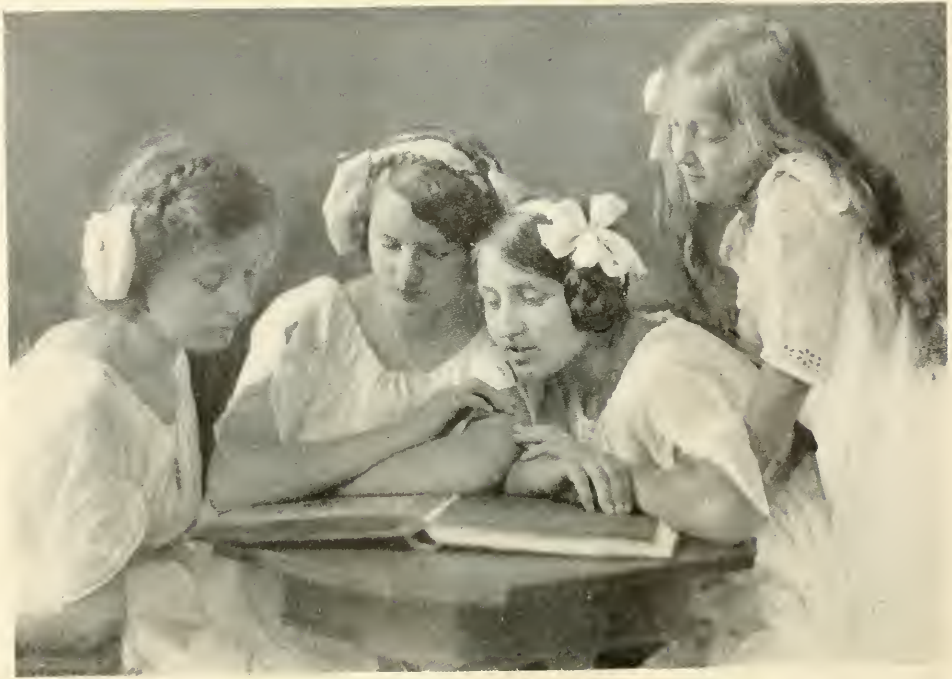
Among the paintings are choice examples of the work of Gainsborough, Teniers the Younger, Jan Steen, Corot, Rembrandt, Luini, Andrea del Sarto, Rubens, Van Dyck, Hobbema, Reynolds, Watteau, Greuze, Vigée Lebrun, Murillo. In his running commentary upon the different collections, Mr. Shelley exhibits a refreshing independence of viewpoint, and a sane judgment of works oftentimes loosely overpraised. This gives an added value to his book, which is full of information for the student of art.

Motion-Picture Work: A General Treatise on Picture Taking, Picture Making, Photo Plays and Theater Management and Operation. By David S. Hulfish. 618 pages; profusely illustrated. Price, $4. American School of Correspondence, Chicago. [For sale by Tennant and Ward, New York.]

Considering the importance and widespread interest which attaches to the moving picture, the dearth of literature about this most modern of entertainments is surprising. Some time ago we noticed the appearance of Mr. Talbot's excellent handbook, "Moving Pictures: How They are Made and Worked." The volume under review is very much more detailed in its treatment of the subject, and by its comprehensiveness will, we are sure, remain the standard work on the subject for some time to come.

The author divides motion-picture work into the three big branches: the making of the pictures; the operation of all standard types of projecting machines; and the operation of the moving-picture theater. Part I, deals with optical lanterns and their manipulation; optical systems for the projection of moving pictures, with the different motion-picture projecting lanterns (pages 1 to 277). Part II, deals with photography (pages 11 to 65), explaining the fundamental processes of negative making; then follows motography (pages 69 to 161), covering the kind of product desired, the methods of production, and the photographic equipment; motion-picture theaters (pages 165 to 207), detailing the management, the starting and operation of the theater. The latter part of this section gives a clear and careful explanation of the electrical principles involved in motion-picture projection; currents, wiring methods, etc., extending from pages 213 to 285. No fact likely to be of interest or help to the motion-picture worker has been overlooked; and the bulky volume is profusely illustrated with halftones and diagrams illustrating every point in the text.

In its general make-up, the book is a compilation of many of the valuable instruction papers issued by the American School of Correspondence, Chicago, and embodies the method there developed and employed successfully for some years past. The man who seeks to learn the motion-picture business from A to Z, whether for practical use or for his information, will find all he needs in this single volume. We commend it heartily to our readers.



An unusual but altogether pleasing group composition
Photograph by I. Meiner, Munich. (From *Das Atelier*)

423

The Photo-Miniature

A Magazine of Photographic Information

EDITED BY JOHN A. TENNANT

Volume XI JANUARY, 1914 Number 129

Photographing Groups

How many pleasures we are missing by our half-hearted use of the camera now-a-days! It seems, indeed, that the much-vaunted simplicity of "snap-shot" photography is blunting our vision; narrowing, instead of widening our horizons; so strangely indifferent are we to the delightful byways which turn off from the easily traveled highway of kodakery, and the inspiringly difficult hill-paths which lead to the high places of pictorial achievement.

In color photography, for example, how much we miss by our failure to appreciate the wonderful possibilities of the simple and practical methods now available. Any amateur, possessing a reasonable knowledge of photographic manipulation, can today enjoy the keen pleasure of making pictorial records of any subject, glowing with the very colors and illusion of life. Think of all that means! And yet, how few of us attempt to realize these possibilities—to reproduce the loveliness of the color mosaics spread in every field and garden, the splendors of sea and sky unrolled along every shore, the web of purple and gold veiling the mountainside at sunset, the splashes of barbaric color in the streets of our cities, or the exquisite coloring which compels our admiration in the faces of women and children. We are warm in our praise of these things when the painter, with patient skill, spreads them on his canvases at the exhibitions. Why do we not gather them for ourselves with the camera? We have become afraid—of anything which looks as if it might offer difficulties. And so we neglect many fields wherein pleasure and profit grow side by side awaiting the harvest—photography at night, stereoscopic photography, the making of large prints from our small negatives, group photography, and other special lines of work well worthy of cultivation.

The Field of Adventure

Here our adventure is to explore the neglected field of group photography, by which I mean the photographing of groups of from three to three hundred persons. Now, admittedly, the making of a passably good portrait group is one of the most difficult bits of work in the whole range of photography. Only the most innocent of amateurs makes group pictures of his friends "for the fun of it." The professional photographer, whose reward depends on the pleasure his customers have in his work, hates the job worse than paying his bills. The natural result, in either event, is deplorable—to use a very soft word. Few, if any, photographs are so unsatisfactory as the average group picture, whether made by an amateur or by a professional. This should not be—need not be. The work may be difficult, but the ability to make satisfying group pictures can be acquired by anyone who will apply intelligent effort along the right lines. And the possibilities for pleasure and profit in the use of this ability offer abundant reward for the labor involved in getting this ability.

Home Possibilities

Let us look at some of these possibilities; first, from the amateur's point of view. For the home album, or for the pleasure of our friends, what could be more interesting than a few group pictures of the family made in successive years; or of friends at the little, informal luncheon or supper; the musical group around the piano; the children at the window or playing with their toys on the rug; the Christmas party group with the tree for background; the girls' birthday party; the home dance, whist drive or bridge party; the group about the billiard-table; the children departing for school; and all the other innumerable unconscious groupings occurring in home life.

Vacation Groups

Then look at the vacation opportunities; the gathering of friends on the boardwalk at the seashore; the tennis group or veranda tea at the country club; children playing on the shore; a walking or driving party among the hills; the picnic at the lake; boating and golfing parties; going to the country dance; groups of friends arriving or departing at the railroad depot; camp-life groups, and so on without end.

Winter Opportunities

In town, also, during the winter months, there are many chances for delightful group pictures; as when amateur or college theatricals are given; when the girls and boys go to the costume dance or theater; a basket-ball game or a group at the bowling-alleys; the groups which gather for sleighing or skating; wedding parties; the women's club tea, etc. Such pictures make the most desirable memorials of life's "happy moments," and yet how rarely do we find such subjects in the amateur's album or collection of prints.

Possible Limitations

It may be argued that, from the viewpoint of the average amateur, with his simple hand camera of limited capacity or efficiency, many of these opportunities do not exist in fact. But this is no reason why the amateur should not broaden his horizon, and make the most of his opportunities by adding a little to his equipment. As a matter of fact, now that the pocket flashlamp and the pocket camera are so convenient in use and so efficient in results, there is no reason why the amateur cannot get a record of any social affair at which he may be present, at home or outdoors, by day or by night.

How Simply Overcome

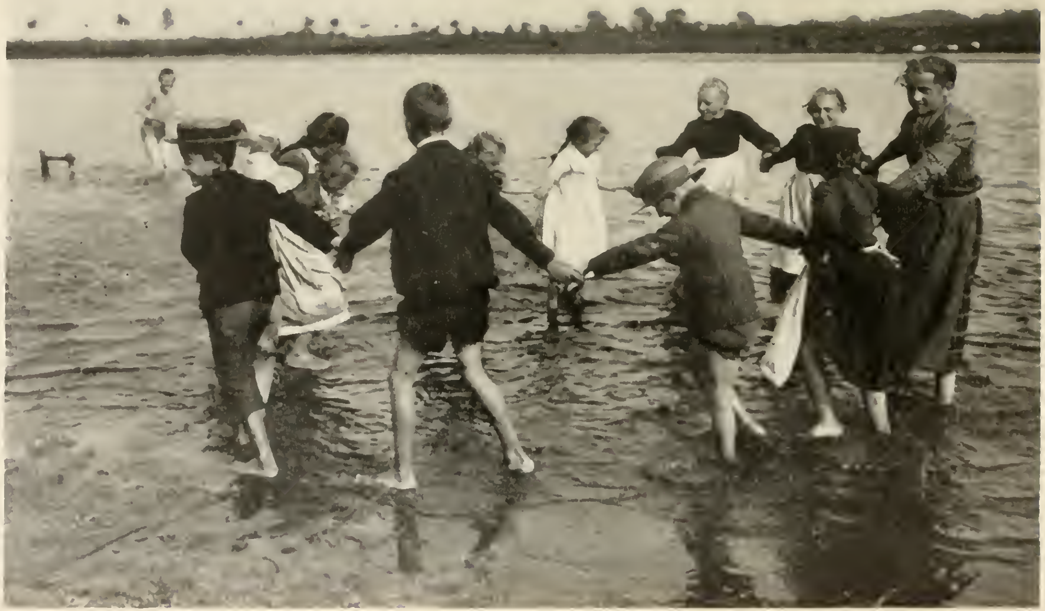
For example: A few days ago I saw a delightful series of group pictures, made at the table of a popular city restaurant, underground and, of course, at night. The equipment used was a vestpocket camera, with a lens at *f*/6.8, and a pocket flashlamp held in the free hand of the amateur using the camera. There was no fuss or bother for anyone, no lugging of heavy apparatus, no difficulties; simply the thought and ability to do what was done. Once the details of lens efficiency, rapid plates and local lighting with a pocket flashlamp have been well considered, these night groups of a few friends, whether in restaurant, home, ballroom or hallway present little real difficulty. The brilliantly lighted rooms, the brightly colored or light-toned costumes worn by ladies, and the speedy color sensitive plates now available, make such pictures easily possible to the amateur who is familiar with the advances made in modern hand-camera work.

The Profitable Side

There is little need to enlarge upon the profitable possibilities of group photography from the professional point of view, these being too well known to require more than mention. But there is room for much more group photography than is being done today, and assuredly there is room for big improvement in the pictorial quality of the professional group work of today. In my own professional experience, I have known a single group negative, made at a society dinner, produce a revenue of over three hundred dollars for the photographer who made it. Such business opportunities are worth considering. Every town, with its fraternal societies, churches, schools, social life and public affairs, offers abundant scope for profitable group work to the photographer who has the ability to make pleasing group pictures and will make his ability known. In New York there are many specialists in this line "making big money" with very little effort, by keeping track of the innumerable social activities of the city. The work here, of course, is done on the speculative plan, orders being taken by circulating a proof of the group among those present before the close of the affair.

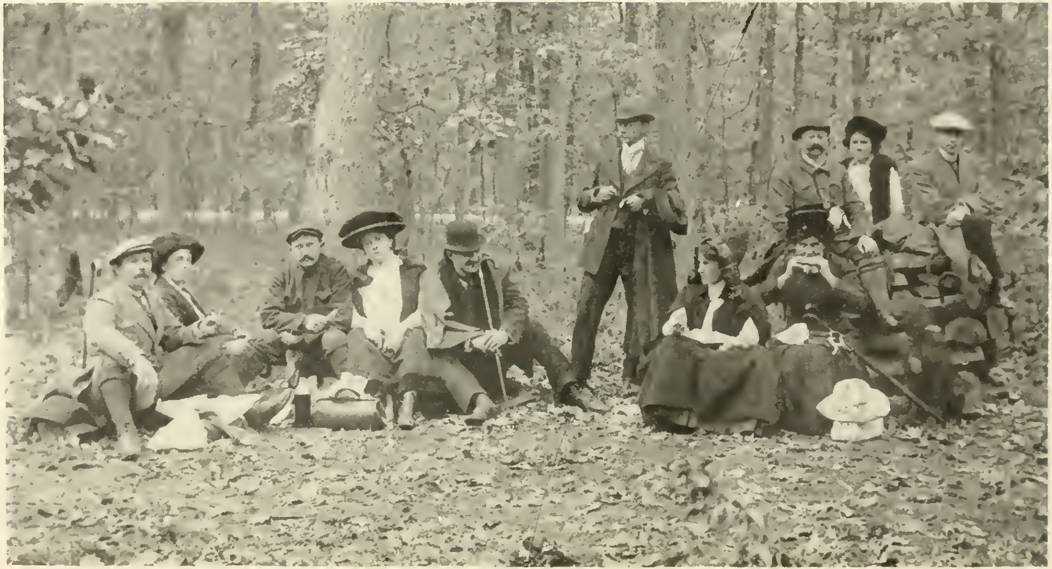
Acknowledgements

So much for the opportunities. How shall the amateur or professional photographer set about the getting of skill in the making of group pictures? The books are silent. Here and there, in the photographic journals, one may find an article on the subject, disappointingly brief and devoid of information. Speaking generally, American and English photographers have little love for group photography, and so have nothing to say about it. So, as often before, THE PHOTO-MINIATURE is



A suggestion leading away from the usual seashore group wherein the figures are closely connected and every eye intent on the camera

Photograph by Max A. Brünner



A happy arrangement of three small groups, loosely connected, to form a large group, all the figures being brought into the principal focal plane, with a pleasing variety of lines

Photograph by Geipelt, Wilnersdorf, Germany the first and only work on the subject. Some years ago, a diligent reader, Mr. J. W. Little, made a compilation of useful hints about group picture making for his own helping. These, with his permission, I am incorporating in the present monograph. For the rest, I am under heavy obligations to Herr Max Brünner, of Berlin, who has for some years past given special attention to this branch of photography. It is, by the way, peculiarly appropriate that this first little book on group photography should come to us from Germany, for it is among German photographers that we find the keenest appreciation of the possibilities of the group and, consequently, a higher average of quality in portrait group work than we reach in this country. This, I think, is apparent in the illustrations of this number, some of which I have taken from the collection of Herr Brünner, while others are reproduced from the pages of "Das Atelier," as representative of the best German professional work of today.

There are so many different kinds of groups, and group pictures are made under such widely varying conditions, that it is obviously impossible to set forth any body of rules and regulations applicable in each and every case. Apart from a few general principles, each group presents its own problems. But by taking up typical instances and discussing one point at a time, we can put together a lot of information which will be helpful to the reader.

The Big Question Answered

First let us dispose of the main question: Why is it so difficult to make a satisfactory portrait group? Think for a moment of the difficulties involved in making a satisfactory portrait of a single person, and the group question will answer itself. In making the individual portrait we have to secure a faithful likeness, a pleasing characterization of the subject, and a harmonious arrangement of the figure within the picture space. These vital things in portraiture, as the reader knows, are dependent on a careful selection of the point or angle from which the subject is photographed, the management of the light (as to volume and direction) falling on the subject, so that it will bring out the most favorable or desirable features, and the composition or arrangement of the lines and masses of light and dark within the picture space, so as to present an interesting and pleasing ensemble of the personality portrayed. This is, admittedly, a formidable list of things to be looked after. Obviously when you try to get all these qualities in a group picture of three or more persons the problem becomes increasingly difficult.

Self-consciousness

The self-consciousness of the average subject, sometimes the principal difficulty in the individual portrait, seems to increase beyond all proportion when a number of persons are grouped together to be photographed. Each one in the group wants to look his or her best, and yet is afraid to make an effort in that direction, lest it call forth the good-natured insinuation of vanity or pose from other members of the group. Oftentimes an unaccountable formality will pervade a group, even when composed of persons who are familiarly acquainted with each other, and this is fatal to the making of a really successful group. The practical result of these things, whether selfconsciousness or formality, is either a general affectation of indifference or buffoonery or a depressing solemnity, defects which may be observed in nine out of every ten groups made.

How to Get Rid of It

Here, then, is our first principle in group photography. Aim to get rid of the self-consciousness or formal awkwardness of those composing the group. This is largely dependent on the personal influence of the photographer. To know how to overcome this difficulty, how to put every member of the group thoroughly at his ease, comfortable and plastic in response to the photographer's handling or suggestion, is the most important thing in group photography. It can be acquired with a little deliberate and thoughtful practice. Begin with groups of three or four persons. Get them thinking or talking about some subject of mutual interest, or occupy them with some quiet action in which each one has his part whether it be doing or watching, such as looking over a portfolio of prints, examining a bronze, or mechanical model, etc. Let them lose their self-consciousness in this association of interest, so that the purpose of the moment will be subordinated. Then, at the most favorable moment, all the technical details having had attention beforehand, with the allowable exception of the adjustment of the illumination, make your exposures.

Practice Essential

This may sound too simple or too obvious to need detailed explanation, but I am here suggesting the method deliberately, as a definite stage in an exercise which should be practised until the reader *knows* that he can handle, manage, control and influence any group of three or four he may have to photograph. The ability to do this, naturally possessed by a few, is possible to anyone who will intelligently follow this method. The successful group picture is not so much the result of ability in exposure, development or pictorial composition, as of personal influence, generalship and control by the man who makes the picture over those composing the group. The amateur can get this practice with his children or friends. The professional has his opportunities in the little groups of two or four persons coming to his studio in the ordinary course of business.

Method Essential

The point is that there must be, in this practice work, a deliberate plan in the photographer's mind to learn how to get his subjects at ease, to so influence or control them by his personality that they will be simply natural when associated with others before the camera, to get their unconscious and willing coöperation in the work at hand. A little experimental work along these lines will accomplish wonders. We generally assume that the trouble lies with our subjects, when, in fact, it is with ourselves. In most group photographs it is evident that the group dominated and controlled the photographer. It is he who must control, and his personal handling of the group is the vital factor in the success of the result.

Two Good Examples

In this experimental work the reader is advised to work with the simplest materials, such as accessories, lightings and arrangements; learning first how to prepare for the group; how to avoid fuss and unnecessary action in handling his subjects; how to get what he wants with few words and as little intrusion as possible; striving only for naturalness and ease in position and expression on the part of his subjects. As examples of this, see the group of four girls, or that of four men at a friendly game, among the illustrations. The first is a studio group, made up of the most difficult material; the other is an outdoor group made by an amateur. Both are good examples of arrangement, lighting, individual portraiture and all the other technical virtues; but they are chiefly interesting to us just now for their naturalness and lack of self-consciousness in the persons photographed.

Composition

Having by this preliminary practice acquired the ability to handle and control small groups, as far as the personal element is concerned, the reader may now turn his attention to the composition or arrangement of groups. Let not the word composition bring up a vision of formidable difficulties. In group photography it means nothing more than learning how to place the figures in such relation to each other, and managing the external and internal lines and light and dark spaces, so as to secure a pleasing and harmonious effect in the finished group picture. Attention to a few elementary principles and the use of a little common sense will solve all the imaginary difficulties.

The Three Principles

The three principles employed are: simplicity, unity, and principality or subordination of interest. Use them in every group you make, large or small, indoors and out-of-doors, and your group pictures will steadily improve in quality and interest. The use of these principles, obviously, involves a complete abandoning of the method of grouping generally followed, of placing the figures in regular formation, row upon row, like sardines in a can. There may be occasions where this formal arrangement is the only one possible, if all the persons assembled are to be included in a picture of given size. But I have only once experienced this necessity, viz. in a group of college girls, where the demand was for a collection of bust portraits grouped together and photographed in a single exposure. Even in this case, by a little thoughtfulness in my arrangement, I managed to get a suggestion of flowing lines which, in some measure, took away the obtrusive formalism of the design. Further improvement was gained by deliberately posing each head to get variety in the view of each face, and taking care that no two heads were directly in the same vertical or horizontal line.

Simplicity

Of the three principles mentioned, the first word must be given to simplicity. In application, this means avoiding complexity of design, awkward lines and abrupt angles, unfilled and unsupported spaces, overcrowded parts and violent contrasts of light and dark; in short, the elimination of unnecessary and distracting elements. These are found sometimes in the figures making up the group, in the clothing worn, or in the background against which the group is arranged. For an example of how inattention to these details will ruin an otherwise pleasing group, see Brünner's group portrait of the family, wherein the table lamp, teapot and glaring white linen of the central figure tend to distraction and confusion.

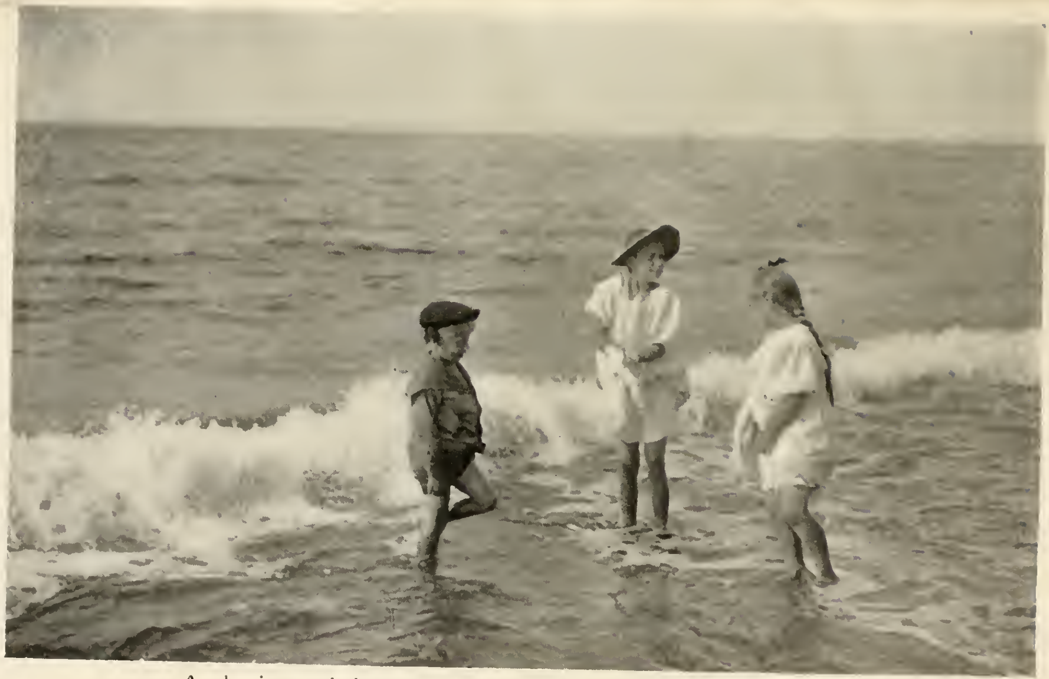
Watch for these disturbing elements as you make up your group. Turning a chair will often eliminate an awkward line; using a higher or lower seat will often remedy abrupt angles caused by the legs of this or that figure. Sometimes a figure in light draperies, or a white shawl, will upset the balance of a group; or the lines of the furniture used may run abruptly into the figures. Where it is not possible to remedy these things before exposure they can generally be modified or removed by hand work on the negative, or helped in the making of the print. Remember that all strong lines are apt to interfere with this element of simplicity, especially in the placing of the figures and accessories. For example: If short sleeves are in vogue among women, the disposition of the arms and hands of the women in the group will present peculiar difficulties. See that they do not catch too much light; keep them soft and subdued in tone by judicious lighting and shading, and help them still further in the negative. Try to get the lines to run in soft curves in and about the figures; avoid lines of undue length; watch the play of light on every important line and see whether it helps or detracts from the general effect.

Unity

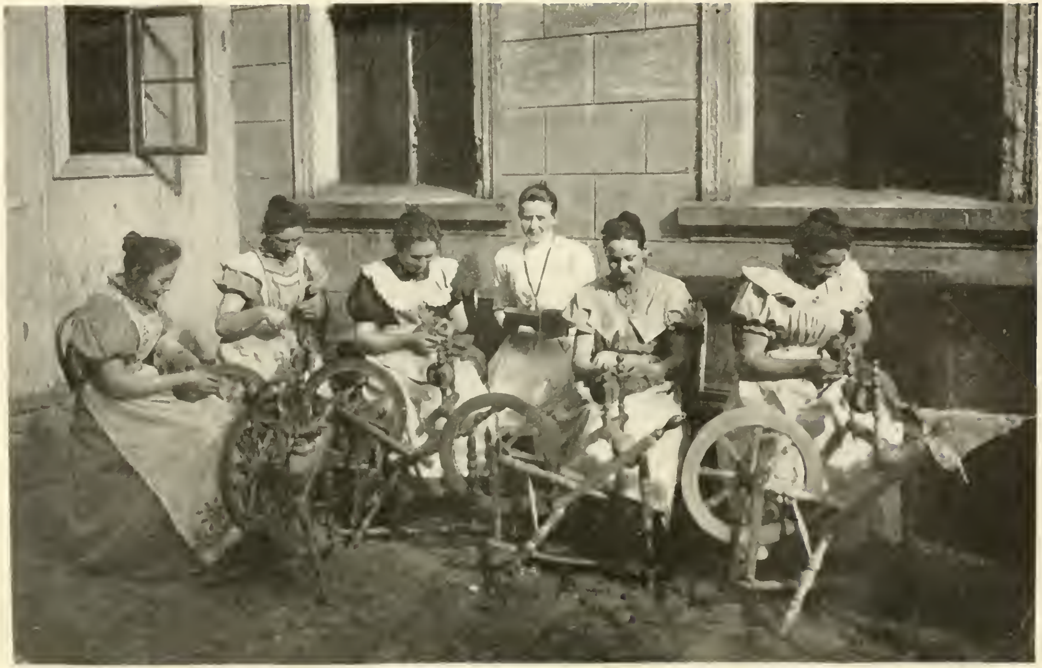
The principal of unity demands that the figures or parts of the group should be sufficiently connected with each other, so that we see the group as one arrangement, rather than as several separate arrangements or figures. This may be effected in many ways. There should be a purpose in every group. This means the emphasis of one figure, or of a small group in a large group, and so managing the other figures or groups that they are naturally connected with the figure or group of principal emphasis. Emphasis, as here indicated, may be given to the main figure or group by lighting, or by deliberate arrangement, or by concentration of interest. For example the family group; a mother reading from a story book or explaining the working of a toy, with the children grouped around her.

Subordination of Interest

In applying these ideas of simplicity and unity in group formation, the other principal of subordination comes into play. Every group, as I have said, should have its purpose, and this means that there should be a point of chief interest in it, to which the other parts of the arrangement must be subordinated. For example: instead of four or five rows of girls and boys stupidly staring into the lens, such as we see in the average summer group made by amateurs at the seashore, why not pose or loosely arrange the figures about any convenient object of interest, such as a child, boat or a fanciful design drawn upon the beach. This subordination of interest is well managed in the outdoor group, by Kübeler, among our illustrations, where we have a pleasing variety of arrangement, with every figure connected with the central figure which forms the principal point of interest in the composition. A bold departure from this scheme is seen in the group by Gottheil, where the interest seems to be divided between the figures at the extreme right and left of the composition, and yet



A pleasing variation upon the usual group of children on the beach
Photograph by Max A. Brünner



A spinning-party

the chief interest is obviously centred on what the girl at the right is reading. In Kübeler's group of the girls' club, also, the interest seems to be divided; but here again the common interest in what is being said by the woman at the extreme left holds the group together.

A great deal more might be said on these points, but what I have given will suffice to put the reader on the right track if he will do a little thinking and experimenting along the lines briefly indicated.

Basic Forms

Apart from the long, processional groups including action or movement, such as a procession of clergy, or a bridal party entering or leaving church, the principal forms adopted in group arrangements are the pyramid and ellipse. But let it be plain from the start that the less obtrusive these forms are in the finished picture, the more pleasing will the group be. They are desirable, and should be used, only to give a structural base for the arrangement of the figures, as we see them used in the pictures of the holy family painted by the old masters. Which reminds me that, among the cheap reproductions of the work of famous artists, the reader will find many useful suggestions which will help him in composing his groups with pictorial effect.

Pyramid: Ellipse

Of these two basic forms, the pyramidal design is generally employed, as equally well adapted to small and large groups. It is the simplest design for small groups of less than ten persons, and the large group of a hundred persons will present the least possible difficulty if it be composed of a number of small pyramidal forms, loosely connected with the central group which should be the point of chief interest in every large group. Among our illustrations the holiday group, by Reiman; the card players, by Treppensee; and the spinning party, by Brünner, are examples of the elliptical form. In the boys' club, by Christensen; the outdoor group and the girls' club, by Kübeler, the pyramidal form may be interestingly followed. The combination of the two forms is well managed in Christensen's boys' club, where the eight central figures form the ellipse, with two pyramidal forms interwoven as supports at either end. Note, also, a good combination of pyramidal forms in Kübeler's group of the girls' club.

Avoid Stiffness

In his attempts to follow these designs and get away from the line upon line, row-upon-row arrangements, the reader must beware of too severely following any geometrical arrangement. For this reason, though they offer many difficulties, the elliptical and circular forms will often give more pleasing results than the pyramidal design. But the latter offers practical advantages because of its simplicity and convenience in handling.

Where this form is used for a large group, the lower limbs of the outside figures may be so arranged as to bring down the sides of the triangle and thus avoid monotony by having all in the same position, but both sides should not be exactly alike. The angles of the pyramid should not be equal, and the line in front should not be straight. In other words, the formation of a perfect geometrical figure should always be avoided. Similarly, care should always be taken to introduce sufficient variety in the shapes and heights of the pyramids to prevent the geometrical arrangement being too obvious. Large pyramids should usually be composed of smaller pyramids overlapping. If one figure in a group is separated in thought or action from the others, its line should also be independent. Small groups compose better than large ones. In a group of two or three, with black and white draperies in juxtaposition, an opposing figure in gray or neutral tone will help in producing a harmonious combination.

Parallelism is objectionable in groups, but some exceptions must be made to vertical and horizontal lines, which often have considerable significance and add to the stability or support of the design.

Emphasis

The chief figure in a group may sometimes be advantageously placed at or near the edge and facing the group, so as to divide the group equally, and so that all the figures may be within a certain distance of the center of interest, providing the action is still proceeding. If the person at the center of interest faces one side of the group, those on the other side should show less interest.

If in a group the line of heads is not sufficient to gather in the converging lines of the figure, this may be accomplished by skillful use of accessories. The gathering line may or may not be curved, but care should be taken to see that it leads the eye back to some leading part of the design and not out of it.

In a group of two the importance of principality cannot be insisted upon, the main point being that the lines of the two figures should combine harmoniously and produce pleasing light-and-shade effects.

In a scattered composition of figures outdoors, there should be one or two figures or smaller groups in the foreground, detached from or loosely attached to the rest of the arrangement. Where concentration is wanted in the character of the figure or figures, there should be few accessories and the background should attract little attention; but, where there is no person of special interest in the group, more attention may be given to the accessories and general effect.

If the group in hand is made up of a man and a woman and one is seated, let it generally be the woman. There are exceptions, such as when we have to deal with a very tall man and an undersized woman, or a stout woman and an unusually slender man.

Any one of the figures in a group may be emphasized by isolation, by contrast with the background, or by position, i.e., by placing the figure in a relatively stronger position in the picture space, by bringing the figure nearer the camera, or by giving the figure vigorous illumination. Any two or more of these devices may be combined or modified.

Heads

Because of their prominence as light spots in the composition, the heads in an indoor group usually attract first attention. It is therefore of the greatest importance, says Bartlett, in his work on "Genre Photography," to carefully consider their relative positions, so as to produce a good visual impression, since we have tried to show that a picture must depend largely for its effect upon the pleasure it affords the eye by the disposition of its lines and forms.

When the imaginary line which connects the heads forming the group suggests the concave, the effect is not as pleasing as when the line is convex. The convexity is not wholly dependent upon the heads, as it may be helped out by the drapery or other accessories. The heads should never be equidistant, or so placed that imaginary lines connecting them would make any regular geometric figure, circle, square or triangle. By simply shifting the position of the figures it is easy to break up this unpleasant uniformity.

Clothing

The placing of the light and dark spaces is a detail of great importance in photographing groups. These contrasting spaces are usually formed of the light or dark clothing worn by the persons making up the group, and unless great care is exercised in the distribution of these spaces it will be impossible to secure a pleasing picture. Avoid, first, the error of placing these light and dark spaces so that they alternate. This gives a spotty effect which is irritating in the extreme. Place the figures dressed in light clothing together, either near the center with figures in dark clothing grouped around them; or make the group up by placing several figures in dark clothing at one end (this to be the principal group in the composition); then group the figures in light draperies together near this large group, and, finally, make a small group in dark clothing at the other end of the arrangement. The idea is to concentrate each mass of color and, generally, to compose the principal group of the smallest number of persons who happen to be dressed in light or dark clothing, as the case may be.

The general principle that those persons with light-colored clothing should be placed near the center, and those with darker clothing arranged on either side, may not apply where it is desired to give equal prominence to each member of the group. In this case, the lights and darks should be grouped together so as to present a harmonious balance in tones. Very seldom should a group be so arranged that those wearing light clothing are placed on either side and those wearing dark clothing are in the center.

The figures most distant from the principal figure in the group should exhibit less interest. When two figures

A friendly game. The natural composition of the figures, individually and collectively, is worthy of note
Photograph by Treppensee, Berlin

A holiday group
Photograph by Reïmann, Munich

are so placed that their arms cross, the formation of right or acute angles should be avoided or concealed if possible. Where there are two figures in a portrait, the darker face should usually be placed in the stronger light, although this will be influenced by the character of the clothing worn by the subject.

Backgrounds

From what has been said, the reader should now have a fairly clear idea of how to go about the arrangement of either large or small groups. It remains to discuss the details of backgrounds and accessories, the selection of a location where choice of place be available, and the technical questions peculiar to group-photography.

In the Studio

For small groups in the studio, a plain or shaded ground, or a combination of either of these with a curtain having no conspicuous pattern, will be found generally useful. The two faults to avoid are the use of too dark or heavy a ground, or one showing an obtrusive pattern or design. Fancy grounds of any sort are undesirable. The depth of tone in the ground will, of course, be governed by the prevailing tone of the clothing worn by the subjects forming the group. Care should be taken to avoid violent contrasts; for example, if the group is made up of girls in light-colored costumes, select a ground of light gray verging upon a soft cream color, so that the contours of the figures will be soft rather than harshly outlined. Keep the group as far from the ground as is practicable. This will give roundness to the figures and prevent the cut-out effect which results from placing the figures close to the ground. If a conventional outdoor ground is used, be careful to have the design somewhat out of focus, and see that the light spot or sky opening in the design does not interfere with the lighting adopted for the group.

At Home

The amateur has more freedom in handling his small groups. In and about the home may be found many spots offering most desirable settings for the little group of two or four persons. If the group is arranged in a room, see that it is sufficiently far from the wall to avoid cast shadows, and so that the wall decorations are either very softly defined or out of focus. Pictures or other objects coming within the field of the background should be removed, except in the rare instances where they can be utilized in the general pictorial scheme. In this latter event, they will generally require softening down in the negative or print, where the lines or the lighting gives them over-much prominence. The general treatment of backgrounds and accessories in home group portraiture will usually be in the direction of subordination or elimination, because of their tendency to appear too conspicuous in the composition. Small home groups may sometimes be arranged with pleasing backgrounds by using the principal doorway or a portion of the veranda as the setting for the group. The lines of the background will here need careful attention. They should be very slightly out of focus, if this can be managed, and kept as subdued in tone as may be practicable.

A Suggestion

If the light will permit of the placing of the group just within the principal entrance to the home, the photographer working from the outside, and the doorway framing the group, the background difficulty will disappear, the interior of the hall giving a soft, dark tone, which forms a most effective setting for the figures. For a fairly large home group, the steps leading to the veranda or doorway will often offer a very suitable setting, provided that the group is sufficiently large (or the steps so narrow in width), that the persistent cross-line effect can be obliterated by the disposition of the figures. Sometimes a rug, or a shawl carelessly disposed, will serve to remedy this common eyesore in groups arranged upon a stairway. Where the cross-line effect cannot be overcome before exposure, the obtrusive lines which tie the figures together can be softened by rubbing them down in the negative before printing.

Outdoor Backgrounds

In photographing outdoor groups, the reader will often have to take his backgrounds as he finds them; but, where a choice of location is available, it may be worth while to know what is desirable and what to avoid. The things to avoid are chiefly incongruity of surroundings and obtrusiveness of detail. The principal thing to secure, if possible, is appropriateness of background to the purpose and character of the group. For examples: for a week-end party at a country house, try to get at least a portion of the house itself to serve as a setting for the group; for a college class, the entrance to one of the college halls; for a boating club, the dock with its clubhouse; for a baseball team, the field with its bleachers; for a riding party, a bit of country road where the shrubbery does not interfere with a good showing of the mounts; for a beach group, use the sea and sky as a background, but be careful to get the horizon line lower than the horizontal center of the group. These are obvious suggestions, but I set them down here because one so often sees the country house party arranged in the formal or informal garden, where the flowers and shrubs are inextricably mixed with the subjects of the group; the college class stiffly arranged against a stretch of stone wall broken by huge windows; the baseball team formed into rows of beefy individuals against a wood fence; and the beach group hopelessly tangled in the lines of a nearby pier or bathing-pavilion, decorated with ugly boardings announcing the coming of "The Girl on the Film" (or the like) at a local theater.

Faults to Avoid

The amateur is as thoughtless in this as the professional. The idea seems to be to get a compactly arranged group, with the figures as large as the plate or film used. Get away from this idea. Try to find an appropriate setting for your groups and let the background and surroundings play their part in the making of the group picture. If, for example, it is a group of girls at a summer boarding house, why not photograph them in one or two boats on the lake or river; or at the entrance to a meadow or glade; or crossing a more or less rustic bridge? If there must be beach groups of one's friends in bathing-costumes, why not group the subjects in the sea itself, or find a convenient bit of rock, or utilize a sand-dune or the hulk of an old wreck? Any of these would be preferable to the average amateur group of young men and maidens in bathing costumes, with their generally unsightly arms and limbs awkwardly arranged in close formation.

Importance of Viewpoint

When it is a question of a large group indoors by flashlight, the background offers many difficulties, but a careful selection of the viewpoint from which the group is photographed will sometimes help matters. Thus, by a choice of viewpoint one can avoid including the pipes of a large organ, or an unsightly platform, or some temporary erection such as the booths at a fair—which details generally assume an offensive obtrusiveness in flashlight interiors. In these cases, also, much can be done by careful handwork on the negative, such as local reduction, the use of the knife, and so on.

The Value of Space

Always leave a little space around your groups; plenty of space above the heads of the groups, and as much as possible in the foreground and at each end. The crowding of the figures to the ends of the picture space gives an unpleasant effect, and the lack of foreground serves to make the legs and feet of the subjects in the group appear abnormal in size.

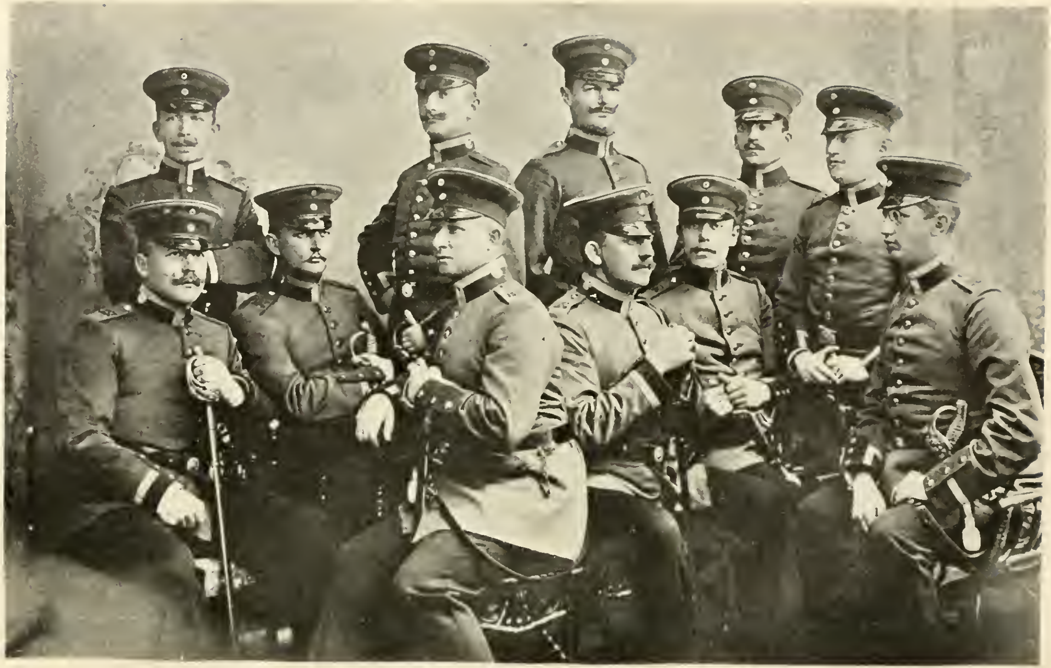
Drawing or Proportion

This brings up the detail of drawing or relative proportion of the figures in a group,—a detail of considerable importance which is often overlooked. If the lens used in group work is short in focal length, i. e., less than the diagonal measurement of the plate used, the figures in the front of the group will appear abnormally large, while those in the rear will be dwarfed in proportion. Further, the figures at the ends of the group will often be distorted, the faces gradually widening to the appearance of a full moon. These faults are generally observable in commercial groups.

Long-focus Lenses

The remedy is in the use of as long-focus a lens as is available in the circumstances. This will necessitate working at a greater distance from the group than with a short focus lens, but the drawing and proportions of the figures will be more pleasing. Attention must also be given, in the arrangement of the group, to the relative height and proportion of each person in the group.

The Boys' Club
Photograph by L. Christensen, Lübeck. (From *Das Atelier*)



A group of German officers, showing an entire absence of the staring-at-the-camera effect which mars so many groups

Thus the taller and bulkier figures may be advantageously placed at the rear, while the shorter figures should occupy the foreground.

An Example

I recall an example which may offer a suggestion. Three clergymen presented themselves at a studio and asked for a portrait group of cabinet (5 x 7) size. Two of the men were abnormally stout, while the third was unusually tall and thin. It was a difficult combination to handle. My first thought was to find a table of suitable size and shape. I then arranged the stout figures, one at each side, and placed the tall man behind the table. This gave me, as it were, a triangular form, the base angles being about 30° and the tall man's head forming the apex. In the composition of the group, the three men sat easily to the table, their legs were "subordinated" by being disposed in the shadow given by the table top, and they were posed as engaged in a discussion, with the tail man speaking. The lens used was a 12-inch focal length Dallmeyer portrait. I very slightly unscrewed the rear combination to give me diffused definition, incidentally obtaining a soft focus of all the three figures, and gave a full exposure. The result was a complete success.

Larger Figures

If the use of a long-focus lens in making outdoor groups is seen to give figures too small for practical purposes, this need not offset the many advantages derived from the long-focus lens in the way of correct drawing and proportion. It is a very simple matter to make an enlarged negative of the group only from such a picture, and so bring the figures up to any desired size.

Cirkut for Large Groups

For making large photographs of groups containing hundreds of figures, such as convention and college groups, the ordinary photographic equipment and standard-size plates are rarely used nowadays, as involving prohibitive bulk, unwieldiness and expense, apart from the technical difficulties connected with their use away from the studio. In their place the modern photographer uses a Cirkut camera and daylight-loading roll film, a combination which renders large group photography as simple as everyday hand-camera work and gives results which are infinitely preferable to the old-style, stiffly arranged group picture with its giants in front and midgets in the last few rows. If the reader is not already familiar with this camera and its peculiar advantages for large-group photography, I suggest that he get the descriptive booklet from the Century Camera Division of the Eastman Kodak Co., Rochester, N. Y., and "read up" on the subject, as any attempt to explain the camera and its use here would take more space than can be given in these pages. This camera, which revolves on its tripod head during the exposure, over any desired portion of a full circle, is fitted with lenses of the symmetrical or convertible type, which permit of a choice among different focal lengths according to the size of figure or length of picture desired. One of its big advantages for group work is that it permits one to spread the group in a loosely arranged form, with only one, two or three rows of figures if desired, thus breaking away from the stiff formalism of the old-style group picture. Another advantage is that, with the Cirkut, we can get the figures almost uniform in height, and without the disproportion in size between those at the front and those at the back which marred the old-fashioned group picture. These advantages count for much in the after-sale of the pictures. With the two smaller sizes of the Cirkut a plate attachment is furnished, so that with the 6-inch Cirkut one can make a film negative 6½ inches in width and of any desired length up to 6 feet, or put on the plate attachment and use the standard 5 x 7-inch dry plate. Similarly, with the No. 8 Cirkut, we can make film negatives 8 inches in width and any length up to 8 feet, or use plates 6 x 8 inches. In using the Cirkut for group work the figures are usually arranged in a semi-circle, with the figures all at the same distance from the camera. In the finished picture they appear as if arranged in a straight line, more or less loosely placed or in close formation, according to the number of figures there may be in the group, the length of the picture desired, or the ideas of the photographer as to pictorial composition of groups of this kind.

With a New Camera

Where the Cirkut camera is not available for the large group, and the photographer is thoroughly familiar with the technical side of the work, the chief difficulty will be found in securing a pleasing arrangement of the figures, especially where the space available is limited. Sometimes a staging will have to be erected for the purpose, as where a good deal of outdoor group work is to be done at a college. At other times a viewing-stand is available, as when the photographing is done at a stadium or other place devoted to outdoor sports. Or it may be possible to arrange the group on the steps leading to the entrance of a public building. In many English college groups of years past I have utilized this particular setting to get pleasing pictorial effects with a minimum of effort. Whatever arrangement may be adopted for the massing of the group, every effort should be made to avoid the stiff line-upon-line effect so common in group work, and to strive for an interweaving of curved lines, with a series of smaller groups within the larger arrangement, and a careful balancing of these in form and light and shade effects. This will call for quick, thoughtful work on the part of the photographer in the selection of figures or groups to be placed so as to give desirable variety in line to the arrangement; but almost any effort to compose the principal group of a number of smaller groups loosely connected will give more pleasing results than are possible with the shoulder-to-shoulder formation so commonly employed.

For Large Indoor Groups

For large indoor groups, where the working area for the photographer may be limited by the necessity of operating close to the wall, in order to include all the subjects in a group, a camera which will close up on its bed and permit the use of a short-focus lens, without including part of the front bed of the camera in the field of view, is necessary. Some of the more compact view cameras are built in this way. The Folmer & Schwing Banquet Camera is a special model of this class, designed for this particular work. It comes in the two sizes generally used by photographers who make a specialty of group pictures, viz. 7 x 17 inches and 12 x 20 inches.

Apart from these specialties for unusual requirements, group photography does not call for special apparatus. It is always advised to use a lens of as great focal length as is possible, for reasons already stated. Further, the anastigmat lens offers advantages over the ordinary rapid rectilinear type, because of its flat field and defining power coupled with speed. Except for instantaneous outdoor group work, the use of a strong, rigid tripod will always insure better results than hand-camera manipulation.

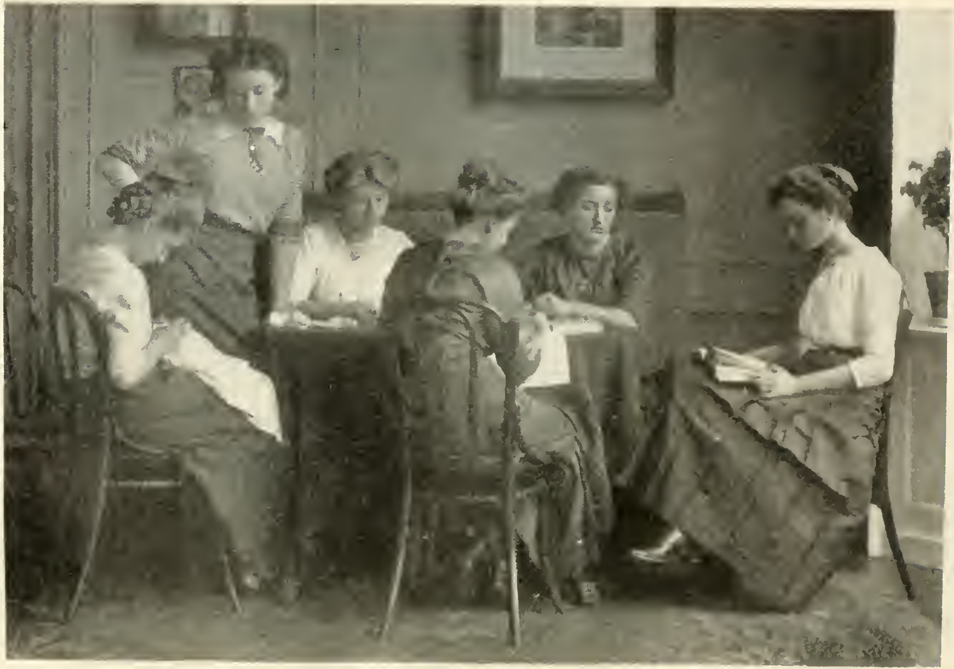
Hand-Cameras

The amateur, of necessity, will use whatever hand-camera may be available. If there is choice, those cameras which give a picture much longer one way than another are preferable to those giving pictures proportioned as 4 x 5 inches. Of the advantages of orthochromatic plates where colors are concerned, nothing more than the hint is needed; and for flashlight work, backed ortho plates offer even greater advantages.

Exposures

As to exposures little can be said, since the circumstances of each group vary so widely, according to the location of the work, the number of figures in the group, and the colors of the costumes and accessories. The reader should note, however, that all groups require a longer exposure than would a single figure portrait under the same conditions. The increase required in exposure may be roughly placed at fifty per cent. Under or scant exposure should be avoided at all risks. Aim for a full exposure, and develop the plate or film for softness—a twofold rule which will do more to insure success in group portraiture than any other rule within the writer's experience. If the group is carefully arranged, so that each figure is comfortably placed and properly lighted, the giving of an ample exposure will not present any real risk of movement. As a matter of fact, many slight faults, such as lack of sharp definition and poor arrangement, will be overlooked in a group portrait if the figures lack self consciousness and the picture is soft in focus and well exposed.

The Girls' Club
Photograph by Wilhelm Kübeler, Darmstadt. (From *Das Atelier*)



A simple, unaffected grouping which gives a satisfactory portrait of each person and a desirable souvenir of their meeting

Flashlight Groups Thus far we have dealt with group photography by daylight. The convenience and practical efficiency of modern flashlight systems, however, urge me to discuss their utility for this class of work, in the home as well as for the larger social affairs where flashlight is generally employed as a matter of necessity. This is a most fascinating phase of group photography, and presents but little difficulty, provided it is approached carefully.

First Principles The principles governing successful group portraiture by flashlight are few but important. First, look to the safety of the flash, so that there may be no mishap either to the group itself or to the room and its furnishings. Choose the equipment carefully and test its capacity and proper handling thoroughly before using it in actual work. A trustworthy assistant is almost essential for all but the smallest home groups. Second, see that you have ample illuminating power. This means a quick, actinic powder, giving off as little smoke as possible. The use of flashbags, which retain the smoke while serving as light diffusers, is advisable for all groups photographed in public places. Where bags are not used, see to the flashlamp before actual use; that it is clean and responsive in use. Do not overload its capacity and so risk an explosion. Load it yourself, and leave nothing to your assistant, after the lamp is ready, except the touch which will give the light. Third, choose the location for the lamp with care, to get the best possible light effects according to the probable arrangement of the figures composing the group. See that it is sufficiently high in position to give an illumination directed at an angle of 45° to the center of the group. And avoid placing the lamp where any chance spark or flame may touch curtains or hangings. As a general rule, the lamp or lamps should be placed at one side of the camera and above it, the distance apart varying with the number of people in the group and the area to be illuminated. In a large banquet-room, where the groups are scattered at tables, the lamps are usually placed twelve or fifteen feet apart along one side of the room, flashbags being almost invariably used in such a case.

Equipment

Every flashlight equipment, whether of flashsheets, or of powder and lamp, with or without umbrella diffusers, or of flashbags, has its peculiar advantages for this or that class of group work. Some are very simple in use, others require lots of intelligence to make the most of their efficiency. Particulars of all of them can be obtained on request from such firms as The Eastman Kodak Co.; G. Gennert; Geo. Murphy, Inc.; The Berlin Aniline Co.; Burke & James, Inc.; Geo. Houghton's Ltd.; or from any large dealer. Preference among them is a matter of individual choice and according to the requirements of the photographer.

Home Groups

The details of a few experiences in flashlight portraiture may be helpful to the reader who has yet to make a beginning in this branch. First, we will take an average home group of three or four persons, such as any amateur may attempt with his hand-camera on a tripod. Before any active preparations are made, go through the making of the group picture mentally; select the room, and the portion of the room, which will best lend itself to the work in hand. Knowing your subjects, make a mental picture of the arrangement of the figures, their relative positions, etc. Determine upon the accessories and background, and see that any disturbing details are removed. Place a couch, or settee, or chairs in position and make ready the camera and flashlight equipment. Now get your subjects, place them to the best advantage, focus with as little lost time as may be; leave all the lights burning as usual and, at the most favorable moment, make the flash and exposure. For such a group the camera may be placed directly in front of the group, about ten feet away from it (or more if the focal length of the lens will permit), with the flashlamp on a line with the camera, about three feet to the right of it, and with the flashpan just higher than the head of the figure which is most distant from the camera. Using an ordinary fast plate or film and an Agfa flashlamp, a charge of fifteen to twenty-five grains of Agfa flash-powder should give a fully exposed picture with the lenses stopped to *f*/32. A group of three or four persons, seated at a table with the usual white napery, will require not more than fifteen grains in the same circumstances as the above. I have made pleasing little groups of two or three figures at a table, with the Caywood hand flashlamp and a single cartridge. A group of girls at the piano will require a slightly larger charge of powder to get the dark ground of the piano in a proportionately relative tone as compared with the costumes of the subjects, which are usually light.

A Larger Group

Now let us take a larger group, say of thirty persons, such as one may see at a lodge-meeting or board of directors. Here a lamp with a capacity of from one-half to three-quarters of an ounce of flash-powder will be needed. Better results will be gained if two lamps are used; one, with a charge of say one-quarter ounce of powder, placed at the right of the camera, at a height of about seven feet; the other, with a charge of say half an ounce of powder, placed at the left of the camera at a height of ten feet and farther from it than the first lamp. The two lamps should, of course, be electrically connected so as to give a simultaneous flash. The larger charge of powder will give the direction of the lighting of the group, while the smaller charge will serve to throw light into the darker shadows of the composition. The lens should be stopped, as before, to *f*/32 for a plate of ordinary rapidity.

Caution: Safety

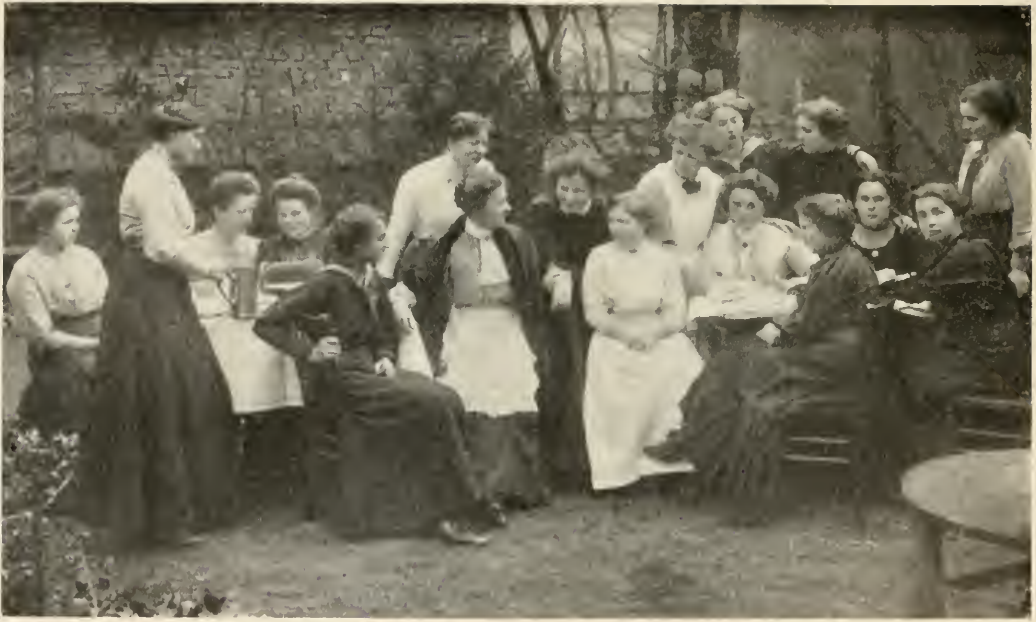
Until the reader has familiarized himself with the safe handling of flash-powder and flashlight equipments, he will do well to employ every reasonable caution in their use. This does not mean that he should be afraid to use the flashlight. As a matter of fact, the flashlight has little or no real risk attached to its use, provided that the user remembers that all flash-powders are explosive, and should be handled with due care as such. For example: In opening the powder container and in loading the lamp, as well as in any handling of the flash mixture, avoid friction. If the powder is caked or lumpy, do not attempt to rub it down by pressure or friction as if it were caked hypo or other chemical salt. In spreading a train of flash mixture on a lamp or powder tray, spread it in a thin, even stream, avoiding heaping or massing. This will give a quicker and more even flame of light, and obviate any risk of an explosion. Especially is the beginner warned not to use a compound powder or flashlight mixture in a closed lamp, such as are sold for use with plain magnesium powder.

The Use of a Screen

For equalizing the illumination on a group, where only one lamp is available, a diffusing screen, placed between the lamp and the nearest figures in the group, will offer advantages not to be overlooked. Such a screen should be made of very fine white muslin, stretched on a light wooden frame about four by five feet measurements, supported at such a height that it will properly screen and diffuse the flash. When such a screen is employed it will be well to open the lens aperture to *f*/16, or even *f*/8, and use about one-quarter more powder than the normal charge required without a screen, in order to make up for the loss of light. For general practice, however, the use of a small lens stop and a liberal charge of powder is advised, as securing good definition throughout, with full exposure and softness.

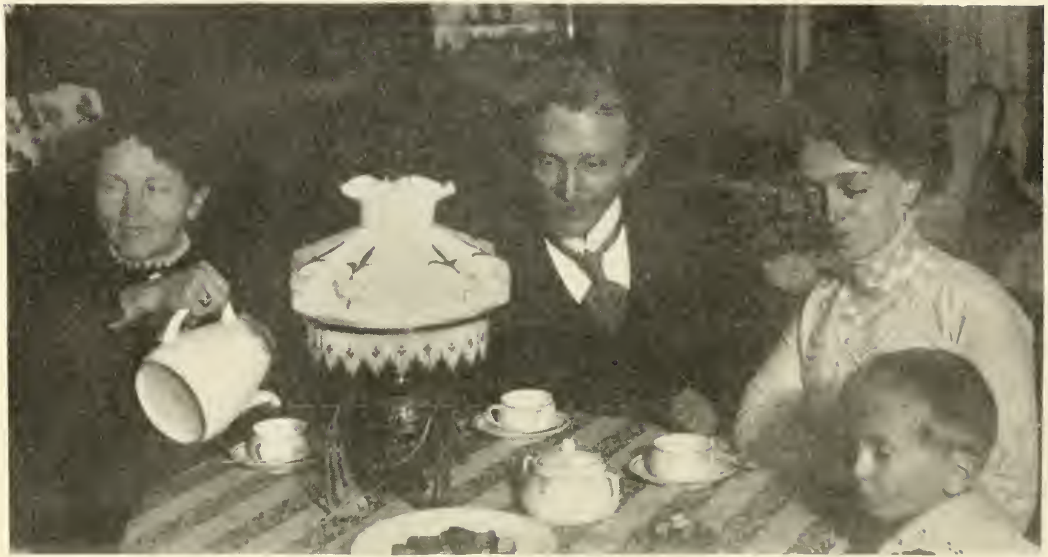
Supplementary Lights

In all flashlight group work the lights, which ordinarily illuminate the room, should be left burning during the exposure, just as usual. If they do not afford sufficient light for the comfortable focusing of the group, let one of the members of the group hold a lighted candle (near the center of the group), and focus on the light. Any lights included in the view, if they impinge on the surface of the lens, should be put out during the photographing as liable to give rise to reflections. The exact position of the lamps or lamp used, in relation to the camera and the group, can be determined only by experience. Generally, the nearer the lamp is to the group consistent with its even illumination of all the figures, the better. But if the lamp is placed in advance of the camera, care must be taken to see that the flash does not come within the angle of view. Always have the windows of the room slightly open when working with flashlight indoors. This will reduce the concussion where any amount of powder is used, and serve to rid the room



A clever example of group formation securing a pleasing arrangement of lines and light and shade with unity of interest

Photograph by Wilhelm Kübeler, Darmstadt, Germany. (From *Das Atelier*)



The Family
Photograph by Max A. Brünner

of the slight smoke which follows the ignition of all flash-powders.

A Good Developer A soft-working developer, which will give clear shadow details, is advisable for all flashlight work. Metol, rodinal and citol, are all developers of this class. The developer I have used for many years with complete satisfaction is a two-solution combination of hydroquinone and eikonogen. It is prepared as follows: No. 1. Hydroquinone, 80 grains; eikonogen, 80 grains; Seed's soda sulphite, 1 ounce; water, 18 ounces. No. 2. Seed's soda carbonate, 1 ounce; water, 6 ounces. To prepare stock solution No. 1, dissolve the sulphite first in boiling water; add the eikonogen and thoroughly dissolve; then add the hydroquinone, and shake until thoroughly dissolved. Let the solution cool, filter carefully and bottle for use. The solution should be of a clear amber color. It will keep quite three months. Stock solution No. 2 is prepared with boiling water in the same way.

Method of Use The virtue of this developer lies in its elasticity and use. For flashlight work I employ tray development and take plenty of time for the work, first making sure that my dark-room has a safe light, and keeping the plate in the developer carefully covered during the whole time of development. For negatives at all inclined to be hard or contrasty, as where the figures in a group are dressed in dark clothing, I take one ounce each of the stock solutions Nos. 1 and 2, and dilute with three ounces of water. For groups with light draperies, or where the general effect was light in tone, I dilute the same proportions of Nos. 1 and 2 with five ounces of water. If there is much white drapery in the group, I remove the negative from the developer as soon as the details appear, and swab the plate with a tuft of cotton charged with a ten per cent solution of potassium bromide, then rinse the plate thoroughly and return it to the developer.

Roll Films For the development of flashlight groups on roll films, I find nothing better than the regular development powders furnished for use with the Eastman tank. But I fine it advantageous to fix the temperature of the developing solution at 70° Fahr. and cut the developing time down to 20 minutes, with the Speed films I always use in this work.

With this we have fairly covered the field of group photography for everyday amateur and professional requirements. The reader who has followed what has been given may be sure that he knows the essentials, and, with a little careful practice along the lines indicated, can be equally sure of a goodly measure of success.

News and Comment

Grand Rapids (Mich.) Camera Club. This club was organized in 1899 by a group of amateur photographers, for their mutual helping, with the special aim of developing the pictorial aspirations of its members. All amateur photographers are welcome to its membership, which exceeds two hundred. The dues are $2.50 half-yearly.

The club has handsome and well-equipped rooms in the Grand Rapids National Bank Building, 95 Monroe Avenue. Members have individual keys, permitting them to enter at any time. The darkrooms are ample in size, with every convenience for working. The club has an enlarging apparatus for daylight and artificial light; and an 8x10 portrait camera, lens, etc., for portrait work.

The annual exhibition of the club is noteworthy for the splendid showing of new work which it attracts year by year. By the invitation of the Trustees of the Ryerson Library, these exhibitions are held in the Art Corridor of the Library, which assures an appropriate setting for the pictures and aids in bringing the work of the exhibitors before the public.

The success of the club has been largely due to the enterprise and loyalty of its officers: Dr. W. A. Rawson (President); H. M. Long (Vice-President); and Miss Fedora E. D. Brown (Secretary-Treasurer). Preparations are now making for the Sixteenth Annual Exhibition, to be held in April. Miss Brown writes that it promises to be the best show of the sort yet seen in Grand Rapids.

The many friends of that little group of earnest workers in pictorial photography which, for years past, has centered about Mr. Alfred Stieglitz, will hear with sorrow of the untimely death of Mr. Joseph T. Keiley, of this city, which took place January 22d last.

Mr. Keiley, by profession a lawyer, was an enthusiast in the movement which, some fifteen or twenty years ago, placed American pictorial photography before the eyes of the world, and his work with camera and pen, in support of this movement, was noteworthy for its brilliancy and splendid quality.

Some weeks ago I had the pleasure of looking over a collection of some thirty or forty prints, showing the possibilities of a method of making photographs in colors, by utilizing a blue-print as the base of the reproduction. This method is the invention of Mr. John Lewisohn, of New York, and patented by him, Serial No. 602,196. The results attained by Mr. Lewisohn are remarkable, especially in the reproduction of colored fabrics, such as plaids and the like, bronzes, etc. The following description of the method is taken from a recent issue of the "Scientific American:"

A negative of a colored object is made on an ordinary orthochromatic photographic plate, using a yellow colored screen, in order to obtain the best color values. From such a negative, an ordinary blue-print is made, which blue-print will, of course, show up the different shade values in their proper proportions. This blue-print is then colored either wholly or in part, by applying red eosin and aurantia, or a mixture of the two, to modify the blue to form any of the spectrum colors, the blue coloration showing through the applied washes with more or less intensity depending upon the extent of the coating wash. Should it be desired to make all or any material portion of the print either red or yellow, or any other color in which blue is not used, the blue of the blue-print is either wholly or partially dissolved by a weak solution of nitrate of silver, which will fix the colors, and, at the same time, will gradually bleach out the blue. Further the blue-print may be washed with this solution, if it is desired merely to weaken the blue color of the object, after the eosin or aurantia has been applied, or a mixture of the two, to form any of the spectrum colors involved in these two primary colors. Should it be desired to restore the blue locally or entirely, or to darken the blue color, the blue-print is respectively touched up or bathed with a solution of ferric chloride, and this ferric chloride may be applied in stronger solution or in succession until that part of the object is practically black. Instead of painting or bathing the entire print in any one of these colors, certain spaces may be touched up locally in order either to darken or lighten those particular parts. In addition to this local treatment, the entire print may be submerged in either of these primary colors, or any combination of the same, to give the different color background and a different tint to the entire picture.

Satista is the name of a new sensitized paper just introduced by Willis & Clements, of Philadelphia. Satista prints closely resemble platinotypes in their tone quality and in the range of gradation, possessing that characteristic richness and luminosity of lights and darks supposed to be peculiar to the platinum print.

Satista is a daylight printing paper, but can also be printed by artifical light. It requires about one-fifth the exposure necessary for printing-out paper; the manipulation is very simple, either black or warm black tones are producible at will, and the prints are said to be permanent in the sense that the detail is not destroyed by time or atmospheric influence.

Clearly, the only thing remaining for the reader is to give Satista a careful trial with a few of his best negatives. We believe that the results will prove abundantly worth the effort. A sample package can be obtained at a nominal cost from Messrs. Willis & Clements.

There are many methods of coloring photographs and many equipments are offered by the dealers. But, in our opinion, Schering's Assur Colors are at once the most convenient and satisfactory of them all. This is saying a good deal. Assur colors were introduced about a year ago, without extravagant claims, and have achieved a remarkable popularity on their merits. They are exceedingly simple in use, and offer a wide range of effects. They are applied to the photograph with a piece of rag wrapped around the index finger, the surplus color at the outlines being removed with a paper stump moistened with turpentine. This in itself suggests the freedom of manipulation, and the latitude there is for making such changes as may be desired in the process of the work. Brushes are used only for the finer details. We suggest that our readers try these new colors for themselves, as a means of adding the charm of color to their photographs.

Home portraiture was never quite so widely practised as it is today. Even the old line professional is leaving his studio and making portraits in the homes of his patrons. But the amateur still maintains his supremacy in this, which is peculiarly his own field.

The difficulty always lies in the lighting of the subjects. This difficulty is completely overcome by the use of the Eagle Home Portrait Lamp, introduced by George Murphy, Inc., New York. The outfit is light and compact, and can be attached to practically any electric-light socket, as it will work on either direct or alternating current. It it fitted with a collapsible reflector and light diffuser, which makes it a simple matter to get just the lighting effect desired.

The wonderfully varied line of pocket- and hand-cameras manufactured by the Ernemann Aktien Gesellschaft, of Dresden, are now obtainable in America at the branch house of this concern, The Ernemann Photo Kino Works, 114 Fifth Avenue, New York, under the management of Messrs. H. J. Hoffman and H. E. Bader. The Ernemann cameras represent the last word in compactness and fineness of mechanical adjustment, coupled with the utmost efficiency. Send ten cents to the New York branch for the beautifully illustrated catalogue of the 1914 models.

If you are thinking of a pocket-camera for 1914—and it would be a profitable thought—send to G. Gennert, 24 East 13th Street, New York; or 230 So. Wabash Ave., Chicago; or 682 Mission Street, San Francisco, for a copy of the New Ensign pocket-camera catalogue. This list includes all the latest models in the well-known Ensign line and is full of interesting facts from cover to cover.

The universal yearning for an "imported" camera in preference to anything made in America has encouraged Allison & Hadaway to establish, at 235 Fifth Avenue, New York, an import house, where any European camera can be had on demand or imported to order. Messrs. Allison & Hadaway have the exclusive agency for several of the best British-made cameras and other photographic specialties, of which they will gladly send particulars on application.

A few years ago we had a new printing-paper forced upon us every other day. Now they come less often. Photoloid is the latest introduction in printing media and it is not a paper, but a rapid, waterproof sensitive emulsion coated on a cellulose compound base of Fibreloid. This is a tough, but flexible substance, which does not curl nor absorb chemical solutions, thus offering an ideal base for photographic prints which will neither fade nor deteriorate. Photoloid prints have a quality all their own, resembling fine carbon prints. Address the Fibreloid Company, 55 Fifth Avenue, New York, for further particulars, after seeing their announcement in this issue of THE PHOTO-MINIATURE.

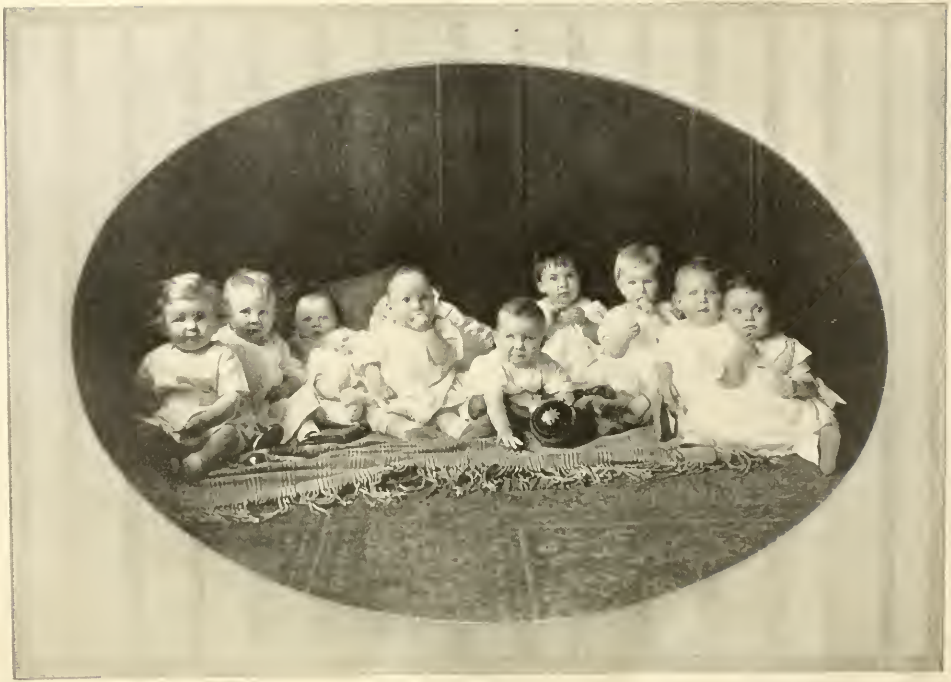
For every sort of flashlight work, but especially for home groups and large interior groups, the best flashlight equipment we know of is made up of the Agfa flashlamp and Agfa flash-powder. These are obtainable from any dealer, or from the Berlin Aniline Works, 213 Water Street, New York.

The second annual convention of the Photographic Dealers' Association will be held at the Hotel Sherman, Chicago, March 24 to 27, inclusive, and will bring together many of the leading dealers and manufacturers of photographic material in this country. The list of exhibitors includes almost every manufacturer of note, with the exception of the Eastman Kodak Company, and it is promised that the display of apparatus and supplies will show every advance and improvement of the year.

In reply to innumerable inquiries for books dealing with color photography, we would like to make it plain that THE PHOTO-MINIATURE No. 128: All About Color Photography is, at this writing, the only book on the subject obtainable in the English language. In this monograph, which is obtainable for 25 cents from dealers everywhere, all the color methods at present available are described and compared, so that the reader can get a bird's-eye view of the subject in an hour or two's reading. It is not a working manual for any of five or six methods dealt with, but a handbook of information to all the available commercial methods—written by one who knows.

The Wollensak Optical Co., of Rochester, N. Y., has been obliged to build a new factory to take care of its rapidly growing business. The new factory is to be a model of its kind, with every conceivable convenience and improvement, providing over forty thousand square feet of workroom space, as compared with the three thousand feet space occupied by the firm when it first began the manufacture of lenses and shutters for photographic use. We congratulate the company on its remarkable growth and success, which is well deserved. Readers of THE PHOTO-MINIATURE visiting Rochester this spring are cordially invited to spend an hour at the Wollensak factory, and see for themselves how the lens is evolved from a piece of Jena glass.

467



HOME PORTRAITURE SIDNEY V. WEBB

The Photo-Miniature
A Magazine of Photographic Information
EDITED BY JOHN A. TENNANT

Volume XI FEBRUARY, 1914 Number 130

How to Make Lantern Slides

With the modern demand for illustration, the general use of pictures accompanying every form of letterpress from the daily newspaper to the ponderous encyclopedia, and the world-wide popularity of the moving picture, the optical lantern or stereopticon occupies a far more important place in the world of today than most of us realize. In almost every phase of social service and public entertainment, in the work of our schools, colleges, and churches, in civic and political campaigns, in industrial education and innumerable publicity schemes, the lantern is now recognized as a necessary and vital element of success. There were, indeed, some who thought that the moving picture would completely oust the lantern from its field as a means of illustration. But it has turned out far otherwise. The optical-lantern industry never was in so flourishing a condition. Thousands of lanterns are made today where hundreds sufficed to meet the requirements of a few years ago. Behind every lantern there are thousands of slides in active use. And behind these, again, there are millions of lantern-slides in the making, or reserved by institutions or manufacturers, awaiting the call for service. In this increasing use of lantern slides the amateur and professional photographer should be keenly interested. Their unnumbered negatives offer splendid material for slide-making, whether for personal pleasure or profit, and, by their specialized knowledge of photographic processes, the amateur and professional should find the making of lantern-slides a profitable hobby or business.

Some years ago, we published in this series a monograph on the various methods of making lantern-slides. The ninth edition of this handbook having been exhausted, it seems desirable to prepare a new work which will deal with lantern-slide-making from the viewpoint of today. In the following pages our present-day methods and processes are explained and summarized, so that the beginner may follow the making of a lantern-slide from beginning to end. For much of the material used, and the illustrations, I have drawn upon a recent editorial article in the British Journal Almanac, by permission of the editor, Mr. George E. Brown, for which my thanks are here recorded. Because of the mass of information requiring compression, I have been obliged to confine the methods given to the production of slides in monochrome. Thus the exceedingly interesting processes and possibilities of lantern-slides in colors from life, by the methods of Ives, Sanger-Shepherd, Lumière-Jougla, Paget, and Dufay, are left untouched in these pages. To deal with them adequately would require a good-sized volume. The reader will find a description and comparison of them in THE PHOTO-MINIATURE, No. 128: Color Photography. For information on the coloring of lantern-slides by hand, the reader is referred to THE PHOTO-MINIATURE, No. 83; while, for a practical handbook to the choice and use of the optical lantern, THE PHOTO-MINIATURE, No. 119, is available.

What is a Lantern-slide? A lantern-slide is simply a positive photographic print on glass, the picture image being viewed by looking through it instead of at it as we look at the familiar paper print. In America the standard size of the lantern-slide is 3¼ x 4 inches; the English standard size is 3¼ x 3¼. Both sizes are used interchangeably in all lanterns. Rarely is the full size of the lantern plate occupied by the picture image, this latter being usually confined within 2¾ inches square, though the shape of the picture is varied according to the preferences of the lantern-slide maker. This is done by placing a cut-out mask over the picture image, the opening in the mask being cut to any desired proportions or shape. Over this mask, to protect the film bearing the picture, a piece of thin glass is placed, the two pieces of glass (slide and cover glass) being firmly bound together by gluing a narrow strip of paper or cloth binding around their edges. In use, the lantern-slide is placed in a projecting lantern, which throws the picture image, much enlarged, upon a white screen placed at a convenient distance from the lantern. The perfection of this enlarged picture on the screen depends wholly upon the technical qualities of the lantern-slide.

Choice in Size of Negative

From this it is obvious that, while lantern-slides can be made from almost any sort of negative, good, bad, or indifferent, a good slide is the natural result only when a good negative is used. As we shall see, however, many modifications are possible in the making of slides, by which defects in the original negative may be helped or remedied. Where negatives are made with a view to the production of lantern-slides, it is well to take advantage of the simplest method of slide-making, i. e., by contact printing, by using a camera which will give pictures of a size suited for the contact-printing method. The 2½ x 3½ pocket or hand camera, such as the Ensign Reflex, Coat-Pocket Tenax, Ica, Pocket Polygon, Ernemann Klapp; or, the 2½ x 4¼ hand cameras, such as the 1A Folding Pocket Kodak, the 1A Graflex, 1A Speed Kodak, 2A. F. P. Brownie, Premoette 1A, the F. P. Ansco 1A, and Folding Ensignette, are models well adapted for this work, as indeed are all hand cameras up to 3¼ x 4¼ picture size. Beyond this, it will generally be necessary to use the reduction method for making the slides.

Two Methods

Lantern-slides are made from a negative by contact printing, as a print is made; or by reduction, as one copies a print in the camera. In the first method, we require a printing-frame which has been previously made thoroughly clean and free from dust, and fitted with a piece of strong, clean glass, free from any blemish or defect. The negative is placed in the printing-frame with its film side up, and a lantern-slide plate is placed upon the negative with its emulsion side in contact with the film side of the negative. A piece of black felt or velvet backing is carefully placed over the two plates, and the back of the frame adjusted and fixed. All this, of course, takes place in the darkroom. A short exposure is then given to the lantern-plate by exposing the glass side of the printing-frame to light, after which the slide is developed and fixed.

In making lantern-slides by reduction, the negative from which the lantern-slide is desired is placed so that an abundance of light comes through it. The camera is focused carefully upon the negative, so that an image of the right size is obtained with perfect definition on the focusing screen. The plate-holder is, of course, charged with a lantern-slide plate. The exposure is made in the camera, just as in copying, and the slide developed and fixed.

Plates

The great majority of lantern-slides are today made on lantern-plates, which are offered by most manufacturers of dry plates here and abroad. The Seed, Cramer and Hammer lantern-plates are familiar American brands. The Imperial, Barnet, Cowan's Chloro-Bromide, Paget, and Marion lantern-plates are well-known imported brands. A specialty is the recently introduced Velox Lantern Slide Film, which is a flexible film, intended to take the place of the ordinary glass lantern-plate. There is no best lantern-plate, and choice among those in the market is entirely a matter of individual preference. There are, however, little differences in the working of the various brands, and it is advised that the reader take one plate and stick to it until he is thoroughly familiar with its manipulation and possibilities.

The Negative

The best lantern-slides, that is, those which give the greatest amount of pleasure when thrown upon the screen, are those made from technically good negatives. If the technically good negative used is one which has pictorial qualities, such as harmonious gradation of tones, atmospheric effects, and a pleasing balance of light and shade, so much the better. All defects in negatives, whether of under- or over-exposure, or of pinholes, scratches, and the like, are magnified in the slide when thrown upon the screen. Similarly, negatives which have had much "faking," and negatives with harsh contrasts, show to great disadvantage in the lantern-slide. If the negative has been correctly exposed and developed and shows a sharply defined picture-image, it can be depended upon to give a good slide. Before beginning lantern-slide making, therefore, the reader should set his negatives up in a retouching stand, or similar convenience, and very carefully work out or touch out with color or pencil any pinholes, scratches, or other slight defects of the sort. If any handwork is to be put upon the back of the negative, care should be taken to use a very fine grade of mat varnish, so that the handwork will not be coarse and harsh, or this will show in the lantern-slide when enlarged on the screen.

Contact Printing

The making of lantern-slides by the contact method requires no apparatus except a printing-frame. While an ordinary printing-frame can be used, it is much better to obtain one specially suitable for lantern-slide work.

The essential requirements of such a frame are as follows:

1. The frame should take a negative one or two sizes larger than the largest which will be printed from. This allows of a contact slide being made from different parts of the subject.

2. It should permit really firm pressure between negative and lantern-plate.

3. It should mask the lantern-plate to the extent of ⅛ of an inch all around the edge, this border thus representing unexposed emulsion.

4. It should allow of successive lantern-plates being exposed to precisely the same portion of the negative.

5. Preferably, for the sake of speed in working, both negative and lantern-plate should be inserted from the same side of the frame.

A Good Frame

With a knowledge of every pattern of frame on the market, I am positive in naming, as the best, one which can readily be made from any good printing-frame in a few minutes. Select a frame with closed ends, or if with open ends, screw in a couple of strips of wood so that the frame is a shallow box without a bottom. Supply this bottom by cutting away the rebate of the frame a little so as to accommodate a piece of ¼ inch board, with a hole (central) exactly 3 inches square. Glue this board into the frame and cover it on the inside with black velvet. Next cut a piece of thin wood or stout artists' millboard, of such size that it fits into the frame with the least possible amount of play, and in this likewise cut a central aperture a shade over 3¼ inches square. This board is hinged to the side of the frame

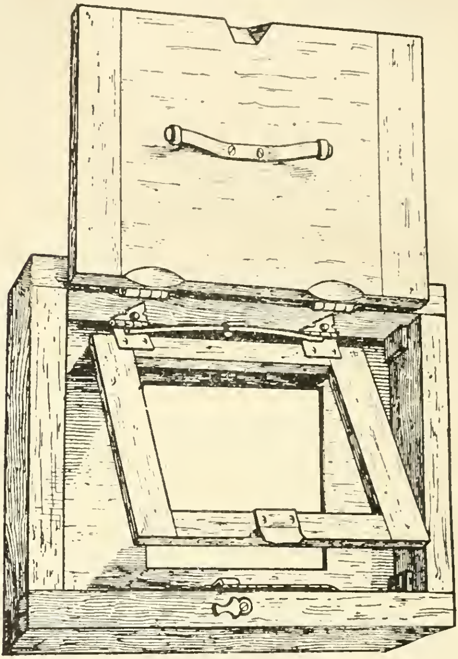


FIG. 1

with either a pair of light brass hinges or a piece of thin leather. The printing-frame is provided with a solid, not hinged, wood back bearing a central patch (glued on) of black velvet, 3 inches square. It is a convenience to have this back-board also hinged to the frame, and to have it snap into place by means of a catch on the opposite side to the hinges, in place of the usual pressure-spring.

The frame is used as follows. The negative is placed face upward on the inner board, and its position adjusted over the aperture so as to include the desired amount of subject. The millboard is then placed over it, the lantern-plate laid in the aperture in the millboard, and the back of the frame put in and sprung down. Such a frame is shown in Fig. 1. This is known as the Doré frame in England. Folmer & Schwing Company, Rochester, N. Y., used to have a similar frame for the purpose.

Working Conveniences

With a frame such as the one described and a supply of lantern-plates, the reader is now ready to make his first batch of slides. There are, however, two or three conveniences which will make the work easier and relieve the worker from a multiplicity of precautions. One of these conveniences is a light, tight box, in which the whole dozen of lantern-plates, stripped of the wrapping-papers, can be kept, and from which the plates can be taken one by one as needed. It is a good plan to fit the lid of this box with a spring, so that it will automatically close. Another convenience is a measuring-tape or board, marked off in distances greater than the normal of twelve or eighteen inches, at which a good negative will be exposed, when the exposures are made with an ordinary flat-flame gas-burner. For weaker negatives, a greater distance from the light is desirable, and, in order to avoid the bother of calculation as to the exposure required at these greater distances, it is well to mark on the board those distances at which exposures twice, thrice, four, and five times normal are required. For example, if twelve inches be taken as the standard distance, and this is a convenient position with the ordinary flat-flame burner, the board should be first marked with the letter "N" (normal) at twelve inches from one end, and then marked off with the following lengths, corresponding with the number of times the normal exposure indicated by the figures in the second line. Thus,

Distance of frame from light,	17	21	24	27	29	32	34	36	38
Times of exposure at 12 inches,	2	3	4	5	6	7	8	9	10

Lantern-slide plates being as sensitive to light as bromide papers or a very slow dry plate, the operations of exposure and development in making the slide are, of course, carried on in the darkroom, making use of the regular darkroom lamp. The exposure of the plate itself is, of course, made by any convenient white light, such as a gas flame; or the darkroom lantern may be fitted with a window of opal glass, or magnesium ribbon may be used, of which more later.

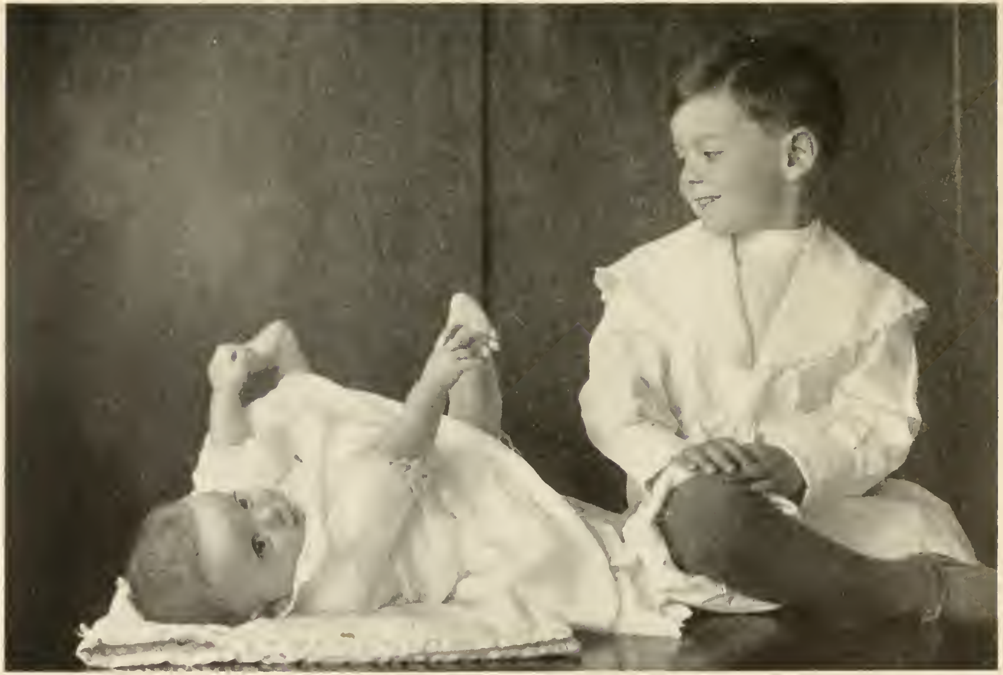
After placing the negative in the printing-frame with its film side up, the lantern-slide plate is put, film side down, in contact with the negative, and the black pad and back of the printing-frame are adjusted. We are now ready for exposure.

Exposure

The exposure, in the contact method, is made simply by holding the printing-frame containing the negative and sensitive lantern-plate at some little distance from any convenient form of artificial light, generally an ordinary gas-jet. The light of an oil-lamp, or a Welsbach gas-burner, or an electric lamp, may be used with equal facility. The whole question is one of getting even illumination over the whole of the negative being printed from. Also as, with many lantern-plates, the tone or color of the slide is dependent upon the length of the exposure and the character of the developer used, it has become a settled rule in lantern-slide making to adjust the exposure to the developer used, in order to control the tone of the finished slide where this is to be used without after-toning.

Distance from Light

Commonly the instructions read to expose the negative by placing the printing-frame about 12 inches from the light. Obviously this instruction needs modification according to the density of the negative, the intensity



HOME PORTRAITURE SIDNEY V. WEBB

of the light, and the speed of the lantern-plate used; but a few experiments with the exposure-board, already mentioned, and a standard negative placed at different distances from the light available, will quickly give the reader a clear idea of the exposure required by that standard negative. It does not do to guess distances in systematic work. Use the board, and you will know at what distance you are working from the light. For a test, suppose we are using a Welsbach gas-burner and are making a slide from a negative of average density placed at 12 inches from the light. Cover two-thirds of the negative and make an exposure of 6 seconds. Now uncover another third of the negative (thus exposing the third already exposed and a new third) and give a second exposure of 6 seconds. Now uncover the negative completely and give a third exposure of 6 seconds. The test plate has now had three exposures: one-third having had 6 seconds, another third 12 seconds, and the other third 18 seconds. Develop, fix and wash this test plate with the developer advised by the maker of the lantern-plate used, and the resulting slide will show which of the test exposures was nearest correct, and how that exposure should be modified to get a good slide with that negative and at that distance from the light. In the case of a very dense negative, the exposure should be made nearer to the light. With a very thin negative, the distance between light and negative should be increased. Note, also, that the nearer the negative is to the light, the greater the power of the illumination to penetrate from dense high lights. When the negative is further removed from the light, the illumination has a softer effect, and hence these greater distances are better adapted for working with thin or harsh, contrasty negatives.

Magnesium Ribbon

In place of gas or oil, magnesium ribbon gives a very good light for the printing of lantern-slides, especially when exposing for warm-toned slides. It is far less easy to get good warm tones in a slide by longer exposures to a weak or moderate power light, than by a shorter exposure to a light of greater intensity—as magnesium ribbon. The most convenient way to burn ribbon in lantern-slide making is to hold the length of ribbon needed for the exposure in a pair of metal pliers. With regard to the exposure, a useful rule to bear in mind is that one inch of magnesium ribbon burnt at a distance of 3 feet from the negative is about equal in effect to an exposure of 30 seconds with the negative 12 inches from an ordinary gas-light flame.

Velox Films With regard to the exposures for the Velox lantern-films, the makers advise a distance of 12 inches from the light, and such an exposure as will allow development to proceed for approximately three minutes, in order to obtain the proper density, snap, and brilliancy in the slide.

When once a standard or unit of exposure has been ascertained with an average negative, the batch of negatives from which slides are to be made should be graded into four or five classes, according to their different densities, the approximate exposure needed for the negatives in each class being calculated from the data obtained by the test exposures. The table of exposures as compared with the normal exposure at 12 inches distance, already given in connection with the marking of the exposure board, will also be helpful in working out the required exposures.

The Camera Reduction Method The reduction or camera method of making slides is, of course, necessary when the whole subject of any negative larger than 3¼ x 3¼ inches is required in the lantern picture. But even when a negative or portion of one allows of the slide being made by contact, there are certain reasons which induce the skilled lantern-worker to use the reduction method. When care is used in focusing, a slide by reduction is usually a little better as regards sharp definition than one by contact. The difference is not very great, and the beginner must bear in mind that unless focusing *is* properly done the slide by reduction can easily be less sharp than one by contact. A second advantage of reduction is that any distorted lines in the negative due to the camera having been tilted at the time of making the exposure may be remedied more or less completely when copying the negative in the camera. To do this correctly requires certain movements. It is necessary that both the negative and the sensitive lantern-plate should be inclined toward each other, and a reduction apparatus must allow of this being done in order to deal successfully with such negatives.

Against this, reduction is a much more tedious process, and it is not such a good process when really warm tones are being obtained by greater exposure and restrained development. The exposure in this case may easily be inconveniently long, and even when the requisite time has been given it will be found that the longer exposure to the less intense image produced in the camera is not so effective in giving good warm tones as a shorter time to a correspondingly brighter light which can be used when working by contact. In short, if you want bright, warm tones, it is better, if you can do so, to print by contact; but otherwise, with practice, the results will be more satisfactory when made by reduction in the camera.

Daylight Reducing Camera

The simplest form of apparatus which can be used for reduction, and one which answers all requirements, is made by mounting the ordinary camera upon a board to which is fixed a frame holding the negative. (Fig. 2.) The best method of mounting the camera to slide along this board is to screw a pair of slips of wood of inverted-V section to the board. A pair of corresponding inverted-V slots are cut in a block which supports the camera. The frame for the negative is fixed to the end of the board either permanently at right angles or as shown in the figure, hinged, and with a pair of side struts (like those of the swing-back of a camera), by which it can be tilted toward or away from the camera as required. The whole apparatus is pointed toward a clear sky, or if the surrounding buildings do not allow of this being done, a mirror is placed at an angle beyond the negative frame, so as to reflect the skylight. In place of the mirror, a sheet of clean white blotting-paper (renewed as soon as it becomes dirty) forms an excellent reflector; in fact, one which is sometimes preferable to a mirror, where the outlines of adjacent objects are liable to be reflected onto the negative.

The camera used may be the ordinary 5 x 4 or half-plate with which the original negatives were taken. It will be all the better, however, if a lens of shorter focus is available, as the dimensions of the apparatus are then smaller. If a hand-camera is employed as a reducing camera, it will be necessary to attach to its open back a supplementary box, fitted with a focusing screen and plate-holder, in order to get sufficient extension for the focal length required for reduction. The distances by which the lens is separated from the negative and lantern-plate respectively follow the law of conjugate foci, but we may give here the figures specially drawn up for the slide-maker.

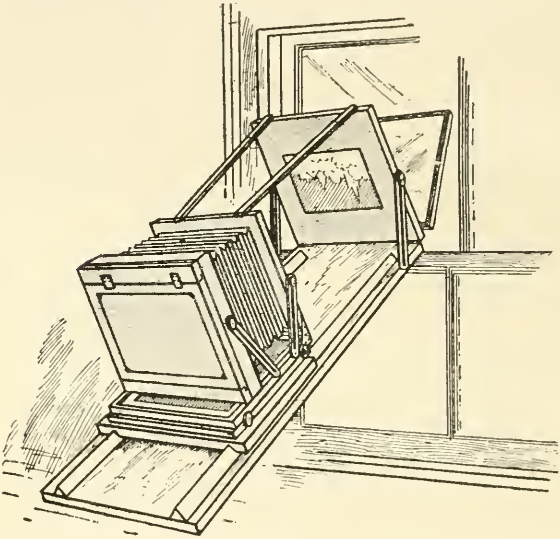


Fig. 2

Table of Distances The following table gives the distances for reductions from various sizes of negatives: A—From lens to lantern-plate. B—From negative to lens. When reducing negatives to a 3-in. lantern-slide.

3¼ x 4¼.—With 5-in. lens: A, 8¾; B, 11⅔. With 5½-in. lens: A, 9⅝; B, 12⅚. With 6-in. lens: A, 10¾; B, 14⅓.

4 x 5.—With 5-in. lens: A, 8; B, 13⅓. With 5½-in. lens: A, 8⅘; B, 14⅔. With 6-in. lens: A, 9⅔; B, 16. With 6½-in. lens: A, 10⅖; B, 17⅔.

4¾ x 6½.—With 5-in. lens: A, 7¼; B, 15¾. With 5½-in. lens: A, 8; B, 17½. With 6-in. lens: A, 10¾; B, 19. With 6½-in. lens: A, 10¾; B, 20½. With 7-in. lens: A, 10¼; B, 22¼. With 8-in. lens: A, 11¾; B, 25¼.

6½ x 8½.—With 5-in. lens: A, 6⅜; B, 19¼. With 6-in. lens: A, 8⅛; B, 23. With 7-in. lens: A, 9½; B, 26¾. With 8-in. lens: A, 10⅝; B, 30¾. With 10-in. lens: A, 13½; B, 38¼.

While it is the focal length of the lens which fixes the length or bellows extension of the apparatus, there is one reason (apart from this) for preferring a fairly large camera to one more nearly the size of the lantern-plate. With the former the internal folds of the bellows do not fall within the path of rays from lens and so scatter light on the plate. To an extent depending on circumstances, a bigger camera (half-plate or over) will give brighter slides than a smaller. A commercial camera of this sort is the Eagle L. S. camera; another is the Prize L. S. camera.

Focusing Slides

The beginner will find a little difficulty at first in setting to work. Having placed the negative (best upside down) in its carrier, a dark cloth or a cover of brown paper is thrown over the apparatus, to cut off outside light; a little stray light between the negative and the lens is of no account, but the light should come as a whole *through* the negative. Next, with the head under the focusing cloth, arrange the reduced negative on the ground-glass of the camera, or rather, on the lantern-size part of it, marked round to correspond with the position of the lantern-plate in the plate-holder. When size and position of the usually faint negative picture have been arranged, the next and last thing is to get a sharp focus. For this use a focusing magnifier, and if you cannot be certain that you are focusing dead sharp, take out the negative and put in its place any old plate (of full density) with a few fine scratches thereon showing as white lines. It is easy to see when these are sharp; the negative is then put back into the same position and exposure made.

Fixed-focus Reducing Camera

The arrangement of negative holder and camera shown in Fig. 2 above has the advantage that it allows of the picture being obtained large or small on the slide, a facility which, as we have seen in an earlier paragraph, is of some importance. But to many the labor of focusing is an irksome business, and for these a camera of the form shown in Fig. 3 is a better arrangement. This is a fixed-focus reducing camera, the simplest form of reducing apparatus where only one size of negative is to be reduced all the time. It is a light-tight box with a frame to hold the negative at one end, and at the other—to hold the lantern-plate—either a frame (lantern-plate size and closed by a light-tight backpiece) or a slightly larger frame in which fits a dark slide holding the lantern-plate. The lens is fixed in a division in the box. Various forms of this apparatus are sold at a small cost. That described is the more convenient, since, with it, it is not necessary to take the entire camera, but only the plate-holder, into the darkroom when reloading. But all are less efficient in

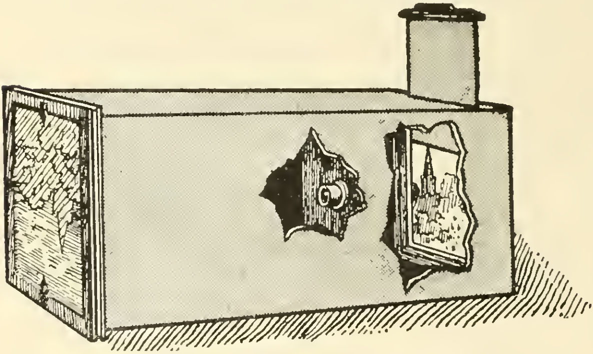
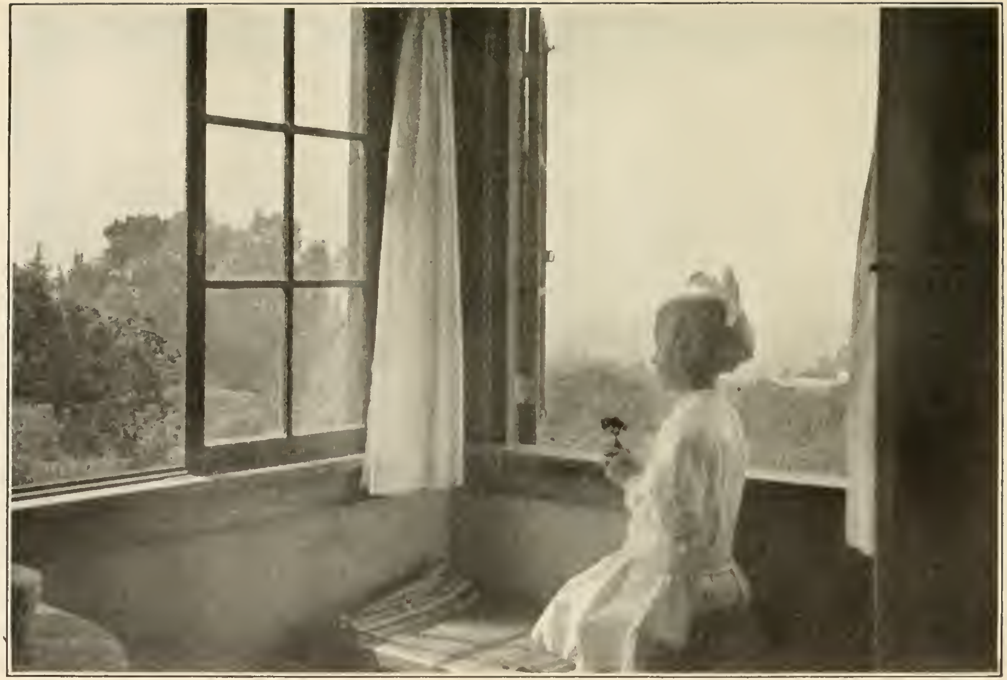


FIG. 3



HOME PORTRAITURE SIDNEY V. WEBB

that the camera is made to copy the whole subject of the negative on to the lantern-plate; one cannot pick and choose, as one can with the apparatus in Fig. 2, nor can errors of tilt or want of straightness in the negative be corrected on the slide. Within its limits, the fixed-focus camera is a very useful apparatus, rapid in use and inexpensive. The Ingento L. S. camera is of this class of fixed-focus instruments.

With Artificial Light

For the sake of the many who cannot find the opportunity of working by daylight, we must say a few words on the means of using such apparatus as the above with artificial illumination for the negative and without the expense of a condenser such as is used in enlarging. There are two systems by which to illuminate the negative: (1) By direct and (2) by reflected light. The former is less satisfactory; it is not easy to arrange electric lamps or gas-mantles to give an even light, even with aid of a diffusing screen, over 5 x 7 or 8 x 10 negatives. Such arrangements, when they are successful, consume much current or gas and give out a great deal of heat. The really best method is to burn magnesium ribbon a short distance behind a screen of *ground*-glass, which again is about two or three inches from the negative, as seen in Fig. 4. The ribbon can be burnt in one long piece, which is pushed through a tube, and at the same time moved to and fro and up and

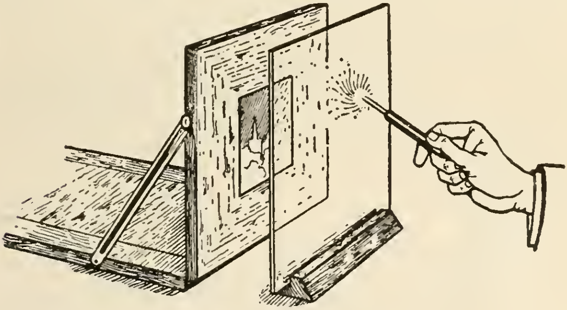


FIG. 4

down behind the negative; or in a series of separate lengths which are suspended from a frame and burnt separately or together—it matters not which. The Eastman Magnesium Ribbon Holder is a convenient device for this purpose. This method has often stood us in good stead when no other means were available, but it needs a separate room for it, owing to the dust of magnesia produced by the burning ribbon.

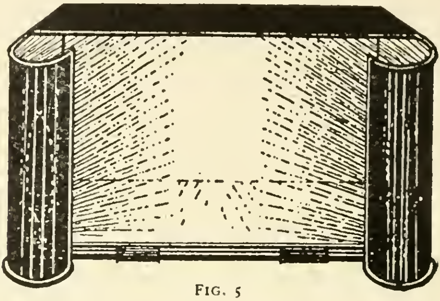


FIG. 5

Reflected light is a much better system, and is carried out in several pieces of apparatus on the market, as shown in Fig. 5, an illuminating screen sold for use in enlarging, obtainable from most dealers. In all these the negative is placed in a chamber facing the back wall of the latter. The back wall (either flat or curved) is illuminated by lamps placed on either side of the negative within the chamber, and thus throwing steady, even light through the negative to the camera placed behind them. Where the negative is small, the Brownie Illuminator offers a ready means of illuminating the negative. Any lamps of this pattern may be used with both types of reducing camera shown in Figs. 2 and 3, both of which may likewise be used upon occasion, with magnesium ribbon as the illuminant.

Reducing with an Enlarger

Paradoxical though it sounds, an enlarging lantern is as convenient an apparatus as there is for making slides by reduction by artificial light. Those who have a good enlarging lantern need only make a small addition to it in order to convert it into a first-rate reducing camera. The enlarger requires, of course, to be fitted with a condenser of diameter large enough to cover the negative. And the distance which the front can be racked out from the negative must at any rate be not less than the distance from lens to negative when reducing in the ordinary way. (See table of distances on page 478.) Thus, when working from a half-plate negative with a 7-inch lens, the extension of the enlarger must be at least 22¼ inches when including the whole negative. If the enlarger will not allow of this, a lens of shorter focus can be used, but for successful work it is best to have one of large aperture.

The attachment for the enlarger, as shown in Fig. 6, consists of a short baseboard actuated by rack and pinion. It is fitted to the lens front of the enlarger, at A, and has fitted to it at right-angles the frame B, with aperture C in which is fitted with a focusing screen and a pressure back, both hinged to it and used, the one when focusing the slide and the other when exposing the lantern-plate. The frame B can be fixed at any angle by the struts, and, though not so shown in the drawing, can be made to rise, fall, and move cross-wise, so as to allow of the picture being exactly centered on the screen. Any camera-maker can supply such an attachment.

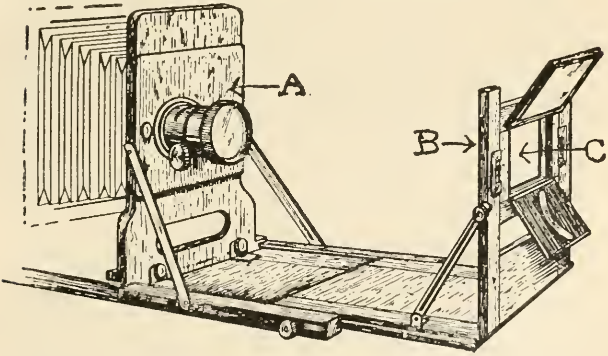


FIG. 6

Exposure The exposures required in reduction work can be ascertained only by experience, depending upon the illumination of the negative and its intensity, the rapidity of the lantern-plate used, the lens aperture, and the tone desired in the resulting slide. As a rough guide, one may say that a 5 x 7 negative, daylight illumination, *f*/22, will require the same exposure as the same negative would require if the slide were made by contact at 12 inches from an ordinary gas flame. The average lantern-plate may be taken to be of the same rapidity as normal bromide paper. A few tests, made by giving successive strips of a lantern-plate a series of progressive exposures, will speedily enable the worker to judge the exposure needed for any given type of negative. As in contact printing, so in reducing, classify your negatives according to relative density, before beginning to make a batch of slides, and the exposure problem will not present much difficulty. It is well also to classify the negatives according to the amount of reduction required so that time may be saved in focusing.

Developers The development of a lantern-plate differs little from that of an ordinary dryplate in negative making. It should be noted, however, that most makers offer two varieties of lantern-plates, one (the more rapid) for black tones, and a slower plate for warm tones. But the distinction between them can readily be wiped out by variations in exposure and development, so that it is hardly important. Thus a black-tone plate, if suitably exposed and developed, will give slides of warm color, just as a warm-tone plate, if developed, say, with metol or ferrous oxalate, will yield a cold tone. But naturally the worker should select the plate most suited to his requirements. This will usually mean using the rapid plates, and obtaining slides of black or only somewhat warm tone when working by reduction, whilst in contact exposures there is no difficulty in giving the longer times necessary for securing the warmer degrees of tone. As to particular formulæ, it is always advised to use the developer given by the maker of the plate employed.

Developers for Cold Tones

The following formulæ are given as standard, and adapted to the average lantern-plate of any maker. For a really neutral black tone, there is no developer to beat ferrous oxalate, though few amateur workers care to go to the trouble of preparing it.

It is made up from two stock solutions as follows: A.—Sulphuric acid, 30 minims; warm water, 20 ozs.; iron(ferrous)sulphate, 5 ozs. B.—Potass. oxalate, 5 ozs.; potass. bromide, 10 grs.; warm water, 20 ozs. Pour 1 part of A into 4 parts of B (not *vice versa*). When this developer is used, plates must be passed straight into a weak bath of acetic acid (1 part "glacial" acid in 60 parts water) after development, allowed to stay there for five or ten minutes, rinsed, and then fixed in an acid bath. This treatment is necessary to prevent the chance of yellow stain, but no other developer requires it.

Metol

Metol is perhaps the next best developer for a cold black tone. A good formula is as follows: A.—Metol, 100 grs.; soda sulphite (crystals), 2 ozs.; water, 20 ozs. B.—Potass. carbonate, 300 grs.; ammonium bromide, 60 grs.; potass. bromide, 120 grs.; water, 20 ozs.

Equal parts of A and B are mixed to form the developer. It will be found that exposures require to be considerably shorter (about half) than when using the ferrous oxalate or the hydroquinone developer.

Hydroquinone

An excellent formula for hydroquinone is the following, given for Imperial lantern-plates: A.—Hydroquinone, 150 grs.; potass. metabisulphite, 10 grs.; potass. bromide, 50 grs.; water, 20 ozs. B.—Soda sulphite, 2 ozs.; caustic soda, 100 grs.; water, 20 ozs. Mix equal parts of A and B.

Formulæ for the Seed, Marion, Barnet, Paget, Cramer and Hammer lantern-plates may be found in the booklets issued by these makers.

Development for Black Tones

In the case of a black tone, development should commence within a second or two of the developer being poured on, and should be complete in two or three minutes. Keep the developer gently moving over the plate, and do not remove the plate from the dish until the shadows commence to block up. Then hold the plate up to the darkroom lamp, and judge the point at which to stop development by looking through. The picture, thus viewed, should appear distinctly denser than it is required to be when finished. You must make allowance for the semi-opaque emulsion in the plate. This fixes out and leaves the image somewhat paler than it appears under the enriching yellow light of the darkroom lantern. As soon as the plate is judged to be of this extra degree of density, rinse it fully under the tap or stand it in a tank of clean water for a minute or two. Then transfer to the hypo bath, and when it is fixed and rinsed from the fixing-bath—but not till then—examine it by white light. Holding it above a sheet of white paper or white porcelain dish, the highest points of light of the subject should appear nearly but not quite clear glass. The point to which the density of the slide is taken should be such that the highest lights have over them just the faintest veil.

Helping Defective Negatives

Of course, the perfect slide by normal development implies a perfect negative. Where the negative is hard in contrasts, the trouble is to avoid a good deal of quite clear glass in the slide. A strong light near the negative should then be used for the exposure, ample exposure given, and the developer mixed with, say, an equal or two-fold bulk of water. On the other hand, in the case of flat negatives, the reverse procedure is adopted, viz.: (1) Exposure to a weak light placed a considerable distance away; (2) avoidance of over-exposure, and (3) the use of a full-strength developer. In the case of slides from such negatives, it is often of advantage to carry development farther than usual and to reduce with the Farmer solution; but beware of the tendency of this reducer to eat out faint densities and to reduce all to clear glass, tones which should be different. The above are the principles which the worker requires to keep in his mind when making the best of defective negatives, so far as development is concerned. As we shall see later, there are other after-processes which he can adopt with advantage, but we will now turn to a fascinating branch of lantern work, the development of slides in warmer colors—warm black, brown, sepia, etc.

Warm-toned Slides

As already stated, the plates most suited for these tones are the "slow" variety issued by almost every maker in addition to the more rapid "black tone." But this is not by any means the only condition for success. The negative requires to be thin and brilliant—the kind of good negative which, as though inspired by some kindly genius, prints well in any process. This is not to say that less-favored negatives are to be put aside as impossible for warm tones; but this quality is of far greater importance when warm tones are the aim than when black tones are being made. Lastly, exposure should be to a bright light. Though an extra degree of exposure is requisite for the warm tone, a greatly protracted time to a comparatively weaker source of light, such as a flat-flame gas-burner, is not quite the same in effect as a shorter time to a more intense light, such as magnesium ribbon. For this reason, exposures made by contact give better warm tones than those by reduction, where the intensity of light on the lantern-plate is necessarily much less.

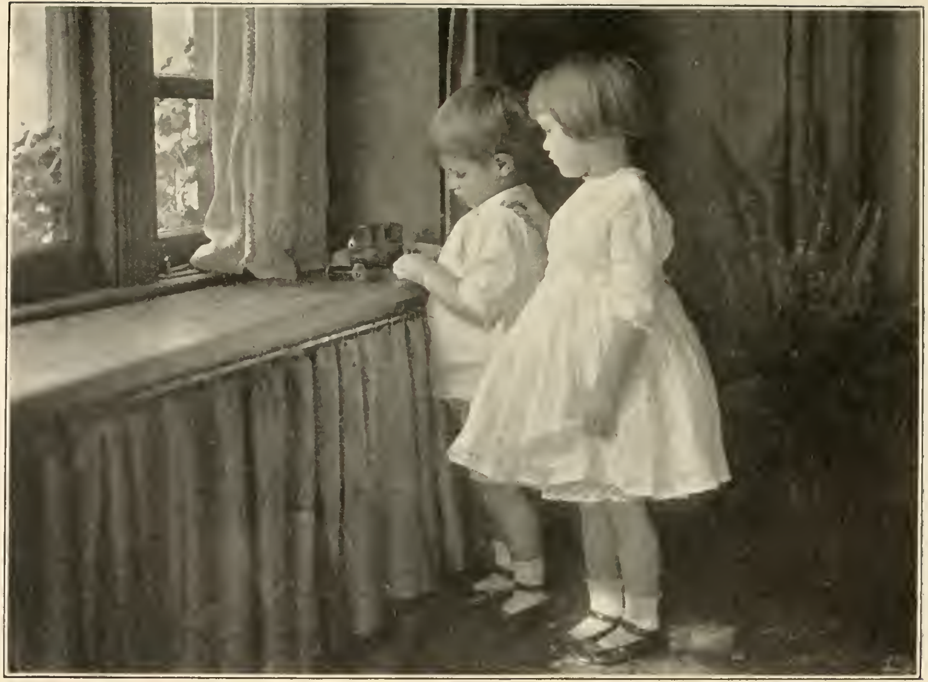
Developers

The two most suitable developers are pyro and hydroquinone. The former is generally used with ammonia; sometimes, with caustic soda or caustic potash; pyro-soda is too slow and liable to stain. Hydroquinone likewise is used with a caustic alkali, caustic potash, or caustic soda. With either pyro or hydroquinone ammonium carbonate is used, and, as the restrainer, ammonium, not potassium bromide. If the worker so prefers, he can compound a developer with which, for a given degree of over exposure, he can obtain a given warm tone. Thus the following pyro and formula of Mr. J. B. B. Wellington, with an exposure of two to four times the normal, gives a pleasing warm black: *Stock Solution*—Soda sulphite, 180 grs.; ammonium bromide, 30 grs.; ammonium carbonate, 30 grs.; caustic potash, 50 grs.; water 10 ozs., to 1 oz. of which add at time of development, 3 grs. of pyro, dry or in 10 per cent solution.

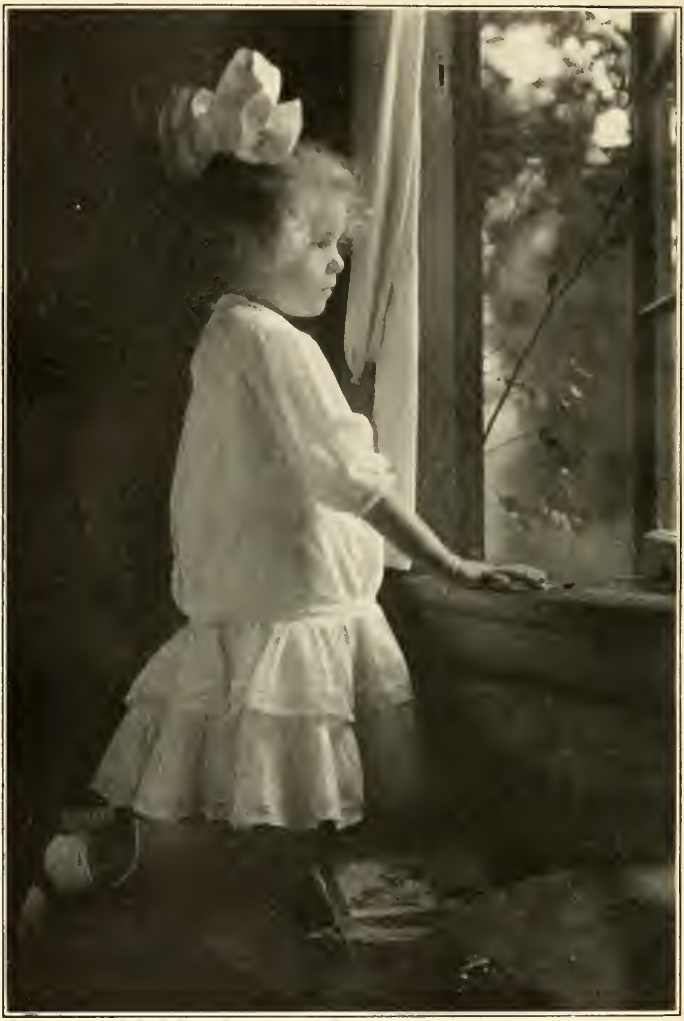
But as most workers prefer to obtain a range of tones in their slides, it is more convenient to make up the developer in separate stock solutions and mix these latter in different proportions according to the effect required.

Hydroquinone A favorite developer for securing a wide range of warm tones is that recommended years ago by Thomas, as follows: No. 1.—Hydroquinone, 100 grs.; soda sulphite, 2 ozs.; citric acid, 60 grs.; potass. bromide, 40 grs.; water to 20 ozs.; No. 2,—sodium hydrate, 100 grs.; water to 20 ozs.; No. 3,—ammonium bromide, 2 ozs.; ammonium carbonate, 2 ozs.; water to 20 ozs. In the original form, the ammonium carbonate was dissolved in a separate 20 ozs. of water, which was used as Solution No. 4; but it saves trouble to use the two together, as above. Compounded as follows (without the No. 3 solution), this developer yields excellent black tones of a warm shade:—No. 1, ½ oz.; No. 2, ½ oz.; water, 1 oz. For warmer tones, developers are made up from the above stock solutions as follows: Brown tones.—No. 1, ½ oz.; No. 2, ½ oz.; No. 3, 15 minims; water to make 2 ozs. Purple tones—No. 1, ½ oz.; No. 2, ½ oz.; No. 3, 30 minims; water to make 2 ozs. Red tones—No. 1, ½ oz.; No. 2, ½ oz.; No. 3, 90 minims; water to make 2 ozs. The tones obtained with this, or any other developer, will, of course, vary with different brands of lantern-plates.

Fixing When development is complete, the plate should be well rinsed and fixed. A plain hypo bath, made up by dissolving 6 ounces of hypo in a pint of water, is preferred by many workers. But this calls for a clearing bath, after fixing, made up of a saturated solution of alum and citric acid (equal parts), and, in my opinion, the use of an acid fixing bath is the better practice. Such a bath is prepared as follows: Solution No. 1—Water, 48 ozs.; hypo, 1 lb.; sulphite of soda (crystals), 1 oz. Solution No. 2—Water, 16 ozs.; chrome alum, 1 oz.; sulphuric acid, 60 minims. Mix the chemicals in the order named. When each solution is thoroughly prepared, pour No. 2 into No. 1 slowly, stirring No. 1 while No. 2 is being added.



HOME PORTRAITURE SIDNEY V. WEBB



HOME PORTRAITURE SIDNEY V. WEBB

Chemical Reduction

The slide which is much too dense or much too thin had better by far be put aside for conversion, by removal of the film, into a cover-glass. There are, of course, circumstances in which it is wise to set out with a view of after-reduction or intensification. But, given a good negative, the result of an under-exposed thin positive improved by intensification will never come near the result of correct exposure and development.

In the case of over-exposure, removal early from the developer yields a thin, flat slide, on which improving methods are wasted ; if the plate be developed to a point of blackness, when held up to the light, then subsequent reduction in a *very weak* Farmer's solution (made by mixing a ten per cent solution of potassium ferricyanide, (poison), with a normal plain hypo fixing solution) will yield a result which will often be almost equal to that of correct exposure and development. But this reducer, whenever it is employed on subjects such as landscapes, portraits, etc. (in fact, all except line drawings, black-and-white sketches), must be used extremely weak. It should be a pale yellow in color, and should require from ten to fifteen minutes to produce any considerable degree of reduction. If used stronger, its action is quicker, but the well-known effect of the Farmer's reducer — of eating out detail while leaving heavy deposits untouched—becomes most unpleasantly marked. Many workers, we know, make a practice of passing every slide through a dish of Farmer's reducer, because "it gives it a sparkle," yet the apparent improvement in the small slide is not an improvement, but the reverse, on the screen. Whenever possible, it is best to leave the use of Farmer's reducer severely alone, that is, as applied to slides which are reasonably good. The "touch of sparkle" is apt to be an illusionary improvement.

Certainly, if the slide is really flat and fogged, then Farmer's reducer can be of great service, but it is folly to apply it to an over-dense slide which, through over-development, is much too dark in the shadows, while the highlights and half-tones are not so far out ; by the time the shadows are remedied, the half-tones will be eaten away almost to clear glass. The persulphate reducer is a more rational way of treating dense slides which have somewhere about the desired scale of contrast, but the slide-maker will soon discover for himself that a fresh plate for exposure and one more cover glass in stock form a formula which is hard to beat.

Intensification

Intensification stands on a little better footing, but the majority of negative intensifiers must be dismissed at once by the lantern-slide maker. Mercury methods are more open to suspicion than when applied to negatives, since slides are subjected to quite high temperatures, and mercury compounds are volatile.

One of the most convenient intensifiers is Piper's chromium formula, given below, since it can be applied within a few minutes of the slide being fixed, is above suspicion as regards permanence, and does not play havoc with the gradation of the transparency. Prepare the following solutions: No. 1—Potass. bichromate, 10 grs.; hydrochloric acid (sp. gr., 1.160) 5 minims; water, 1 ounce. No. 2—Potass. bichromate, 10 grs.; hydrochloric acid (sp. gr., 1.160), 20 minims; water, 1 oz. Bleach the slide in No. 1 or No. 2, according to the degree of intensification desired, wash until the yellow stain is removed, and then develop (in daylight, or after the plate has been exposed to daylight) with amidol. Solution No. 1 gives intensification about equal to that obtained with mercury and ferrous oxalate; No. 2 intensifies as mercury and sodium sulphite. Rinse the plate well after fixation and before applying the intensifier. The process may be repeated if this is necessary to get sufficient intensity.

After Toning

Where the lantern-slide, as developed and fixed, does not present the tone or color desired, it is usual to have resort to various methods of after-toning. In giving a selection of approved formulæ for effecting this purpose, it should be noted that the colors obtained will necessarily vary when used with different brands of plates.

Brown to Grey Tones

When a slide is hard and lacks transparency in the shadows, one or other of the following is a very useful process: The slide, well washed from hypo, is simply bleached in a solution of mercuric chloride and dried. This gives a brown tone. The exact strength of mercury solution is not material—about 10 to 20 grs. mercuric chloride per ounce of water. In this process the silver image is converted into silver-mercury chloride. A somewhat similar method, due to Mr. Welborne Piper, consists in converting the image into the chloride, bromide or iodide of silver.

For the chloride, the bleacher is: Potass. bichromate, 10 grs.; hydrochloric acid, 5 drops; water, 1 oz.

For the bromide, it is: Potass. bichromate, 10 grs.; potass. bromide, 5 grs.; nitric acid, 5 drops; water, 1 oz.

For the iodide, potass. iodide is used in place of potass. bromide.

Bleaching, in each case, takes a few seconds only, after which slides are put aside in weak solution of potass. metabisulphite (to remove the yellow stain of the bichromate), washed and dried.

The tones are not fully obtained until slides have been exposed to strong daylight for a day or two, or for a few hours, to sunlight. The final tones vary with different plates, but average:

Chloride bath = warm brown.
Bromide " = cool grey.
Iodide " = brown.

Owing to the greater transparency imparted to all tones by these four methods, they are, as we have said, best suited to slides from hard negatives which yield a soft harmonious positive with difficulty.

Sulphide Toning and Redevelopment

One might think that the process of sulphide toning, so generally successful with bromide papers, and now with most gaslight papers, would be just as satisfactory with lantern-slides. But it is not uncommon to find slides refuse to darken to the brown tone in the sulphide bath. When the ordinary (alkaline) development is done, it is found that plates vary a good deal as regards amenability to sulphide toning; but when a slide does come up again to full vigor in the sulphide bath, the result is a very fine sepia positive, possessing great transparency in the shadows when on the screen. The process is carried out as for prints, though a bleacher of potass. bichromate and hydrochloric acid is better, as a rule, than the mixture of ferricyanide and bromide used for prints.

Piper's Method

Mr. Piper's method is as follows: Bleach the slide in a solution made up of potass. bichromate, ¼ oz.; hydrochloric acid (pure), ½ oz. (fluid); water, 10 ozs.

After bleaching in this, the slide is well washed and redeveloped in a developer for warm tones, such as one of the formulæ given in an earlier section.

Thus a suitable developer for a fine brown tone is: A—Hydroquinone, 160 grs.; potass. metabisulphite, 90 grs.; potass. bromide, 20 grs.; water, 10 ozs. B—Ammonia (0·880), 1 oz.; ammonium bromide, 1 oz.; water, 10 ozs. A, 1 part; B, 1 part; water, 2 parts.

The development requires to be done in a good bright light (daylight).

Dye-Toning

Another method of toning utilizes a series of dyes. This was first introduced by Traube as the Diachrome process.

The silver image of a lantern-slide or transparency is converted into silver iodide. Silver iodide acts as a mordant to basic aniline dyes and to the eosine group. If, therefore, the slide, so transformed, is placed in a solution of the dye, the iodide will absorb the dye, the excess of which can be washed out of the clear gelatine, but not out of the image. The silver iodide in this colored image may then be dissolved out, leaving the color solely combined with the gelatine.

There are several ways of doing this. Traube used a bath of iodine dissolved in iodide of potassium, but it stains the fingers and is otherwise objectionable. It seemed that a mixture of potassium ferricyanide and potassium iodide should give the iodide, just as a similar mixture yields the bromide in the well-known sulphuretting process, and it does. A bath is made up of potassium iodide, 10 grains, and potassium ferricyanide, 20 grains, to the ounce of water, and in this the slide is immersed. It immediately bleaches, but should be allowed to remain ten minutes longer, until the yellow tint of silver iodide is fully developed. Then wash ten minutes.

The plate is next immersed in a solution of the required dye. That used was of strength of 1 grain to the ounce. It was here the first difficulty was met. It has been stated that the image fixed the dye immediately. It mostly does nothing of the kind, and the plate must be left in the solution until the yellow color of the iodide has completely disappeared, which, with dense slides and some dyes, may require several hours. The complete saturation of the silver is a necessity. The slide is next placed in running water, where it must remain until the whites are clear of color. With some dyes this occurs quickly, with others slowly, and with many not at all; and, of course, such must not be used. Among dyes which have been named for this purpose are: Methyl green, brilliant green, Turkey blue, rhodamine blue, chrysoidine, methylene blue, malachite green, crystal violet, and auramine. A special series of dyes for the process is prepared by Messrs. Griffin and Sons, London. The ordinary black-tone slides are bleached in a solution of iodine in potass. iodide, washed, and put to soak for from 15 to 30 minutes in the dye-bath, the strength of which is not very material. When seen to be of full depth, the slide is transferred to weak acetic acid for a few minutes to clear the highlights of dye, washed, and dried. Contrary to what will be expected from the vivid appearance of the toned slides, the effect on the screen is not at all garish. The tones when projected are quiet greenish blacks, browns, dark purple, etc. I am writing of the dyes supplied by Messrs. Griffin, and of following the procedure above.

The process can be varied to the extent of removing the silver iodide by means of a bath of 10 per cent hypo containing some tannin and soda acetate. This leaves an image in dye only, but it is apt to be deficient in intensity, and will usually be of much more vivid color.

The image, being composed of dye, cannot be expected to possess the great permanence of the ordinary black-tone silver image, but since slides are so little exposed to light it can be depended upon to last for years. Dr. H. D'Arcy Power gave his experiments with this method in Camera Craft, December, 1911.

Dye-Toning A very simple and efficient way of producing dye-toned slides is found in the use of Schering's Varitone Tablets. With these tablets (which come in tubes numbered from 1 to 7) green, brown, red, and blue tones may be obtained. In working with these tablets, it should be remembered that the solutions are to be used in artificial light or very subdued daylight. All the solutions hereafter mentioned are made by dissolving the tablets mentioned in 3½ ounces of water.

Green Tones Take two tablets No. 1, two tablets No. 2, dissolve in 3½ ounces of water, and, when thoroughly dissolved, add two tablets No. 3. As freshly prepared, this solution will tone a normal slide in about three minutes; a strongly developed slide may require up to five minutes, and the toning solution works more slowly if it has been previously used. A freshly prepared solution will produce a bluish green tone; a solution that has been used previously gives a more yellowish green. The quantity of solution given will tone six or eight slides.

Washing When the tone desired has been reached, wash the slides in running water, preferably under a spray. The water should not be too cold, 75 to 100° Fahr. being preferable, as clearing the whites or transparent parts of the slide and giving brilliancy to the color. The slide should be washed after toning about fifteen minutes, or until the transparent portions of the slide are perfectly clear.

Brown and Red Tones Take two tablets No. 4, four tablets No. 3 and four tablets No. 5. Dissolve in 3½ ounces of water. In this solution the tone of the slide changes first to a sepia, then to chestnut-brown, and finally to red. The sepia tone will appear in about half a minute, and the red tone will be reached in from three to five minutes. If a pronounced red tone is required for any special effect, as in slides of firelight portraits, another tablet No. 5 should be added to the above solution. Washing is done as after green toning, but about ten minutes will be sufficient to clear the whites. Unduly protracted washing or the use of an alkaline wash-water will tend to weaken the brilliancy of the tones.

Blue Tones Take four tablets No. 5, two tablets No. 6, and dissolve thoroughly in 3½ ounces of water. When thoroughly dissolved, add four tablets No. 3. A blue-black tone is obtained in this solution in from five to ten minutes.

If a light blue tone is desired, the slides are taken from the above bath, washed for only two or three minutes in water, and then transferred to a solution composed of one tablet No. 3 and one tablet No. 7, in 4 ounces of water. In this solution, the light blue tone will be secured in from one-half to two minutes, according to the density of the slide. Wash in cold water for five minutes, and then again wash for five minutes in warm water at about 80° Fahr.

Greenish Blue Tones These are obtained by first toning to blue-black as above, and then immersing the slide for a few minutes in water slightly acidulated with hydrochloric acid.

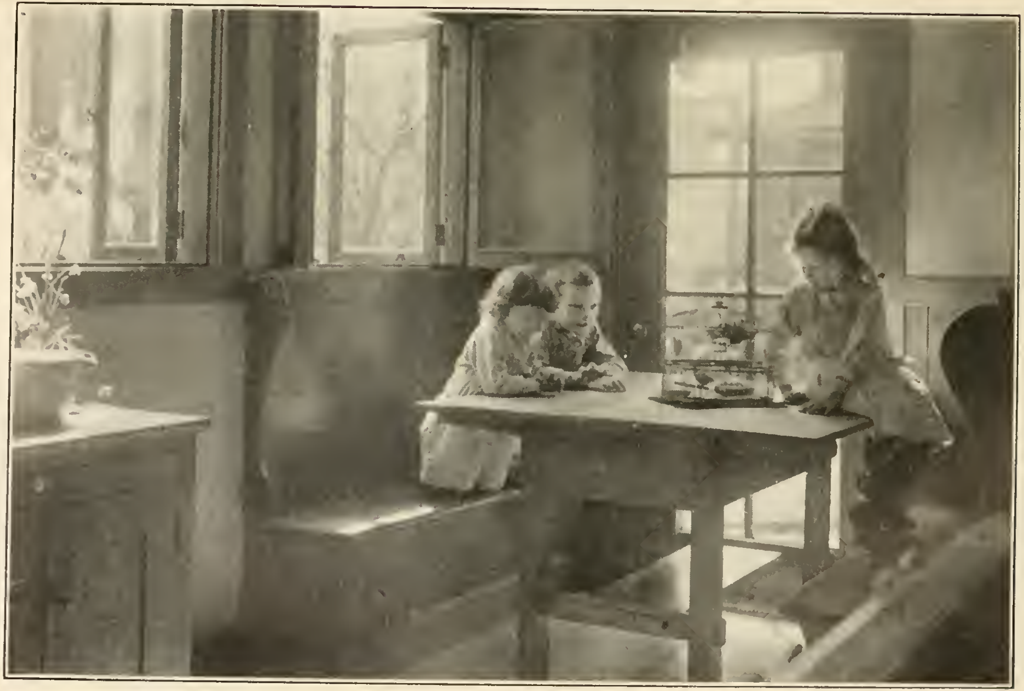
It should be noted that the toning action of these dyes will vary slightly with different brands of plates and the color of the slide after development. A little experience with the plates in use will quickly enable the worker to vary his tones to give just the color-effect desired.

Clouds Slides with an expanse of bare glass for the sky are now as universally abhorrent as is the same effect in a print. Public lecturers, not photographers, continue to show them, in ignorance, apparently, of their tonal falsity, but among photographers a "bald-headed" slide, as it has been cleverly christened, is no longer tolerated. The slide-maker must, therefore, look to his skies. In doing this, he will rarely come across a negative in which the clouds present in the sky at the time of exposure print satisfactorily in the slide. More usually they are absent altogether, or of such density in the negative that exposure of the plate for the landscape is insufficient to secure the clouds in the slide. A little can be done in development by going over the sky portion with a stronger developer, or one such as rodinal or metol; but the chief aid lies in shielding the landscape portion of the negative during part of a total exposure long enough to bring out the clouds. When making slides by contact, this is not difficult. A mask is cut roughly to the outline of the landscape, and is kept slightly moving, about an inch in front of the negative, for part of the exposure. When making slides by reduction, the apparatus will not always allow of a mask being so placed and moved, although, when using an enlarging lantern for the purpose, as described in a previous paragraph, it is readily done.

As a general rule, however, it is necessary to insert clouds from a separate negative, for doing which one of two methods must be followed: (1) Printing the clouds on a second lantern-plate and using this as the cover-glass, or (2) printing the clouds on the same lantern-plate as the landscape, the sky of which is masked when printing the latter. When using the first method in contact printing, it must be borne in mind that the clouds appear reversed, so that a lighting the opposite of that in the landscape requires to be chosen. This is not the case when working by reduction, since the cloud negative can be put either way (film or glass side toward the light) into the carrier.

The cover-glass method is by far the easier. When making the slide of the landscape, the sky portion must be caused to print as clear glass by blotting out the negative on the glass side with some "photo-paque." If the negative has a fairly dense sky, it will not be necessary to block out; a swab over the sky portion of the slide with Farmer's reducer on cotton-wool will clear away any deposit. The slide is then washed and dried as usual. For the sky cover-glass a cloud negative is selected and adjusted in the lantern-slide printing-frame or in the reducing apparatus, so that, when the landscape slide is laid upon it (upon its image, in the case of a reducing camera), the clouds come as they are wanted.

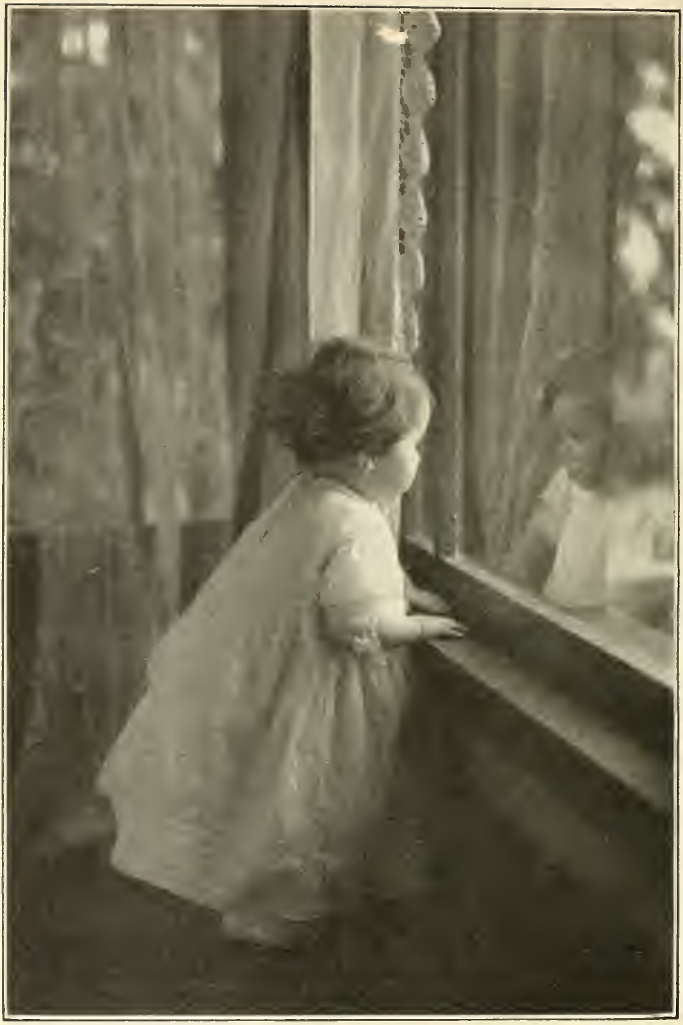
Exposure is then made on a lantern-plate. There is no need to block out part of the cloud negative; the part which will cover the landscape is reduced away after the cloud slide has been developed and fixed. To do this, the cloud and landscape slides are placed glass sides together, and, with a tuft of cotton wool soaked in



HOME PORTRAITURE

SIDNEY V. WEBB

5-07



HOME PORTRAITURE SIDNEY V. WEBB

Farmer's reducer, the image on the wet cloud slide dissolved away where it runs over the landscape. After more washing and drying the cloud side is bound up with the landscape transparency.

The making of cloud and landscape on the one plate is a more troublesome process with practically nothing in its favor. With two plates it is not easy to obtain precisely the same warm tone by over-exposure and development, but, when such warm-toned slides with clouds are required, one or other of the more modern toning processes can quite well be used. In working this second method, a mask of the size and shape of the sky in the landscape negative is made and used about an inch in front of the negative, to obtain the sky as clear glass. For the second exposure to the cloud negative, a mask of the size and shape of the landscape is similarly kept slightly moving in front of the cloud negative, so as to protect the landscape already printed. The doubly exposed plate is then developed and finished as usual, and bound up with a plain cover-glass.

Diagram Slides

Lantern-slides, today, are often required to be made from diagrams, drawings, engravings, black-and-white illustrations, maps, and so on, in which the subject is shown in black lines on the white ground. Such slides are used for announcements for the exhibition of songs, music, for educational purposes, the illustration of technical lectures, and the like. The production of such slides, with intense blacks and clear whites, is comparatively easy if the wet-plate process be used; with the dry-plates now generally employed, it is not so simple a matter to get these two qualities in the slide.

For this class of work, what is known as a "process plate" is preferable to the ordinary lantern plate, and since it is often possible to make several negatives at one time on a large plate, the ordinary copying camera may be used in the production of the negatives with a saving of time and trouble.

The Method

The prints or diagrams to be reproduced are, if possible, mounted together on a sheet of white cardboard and properly illuminated, so that the grain of the paper is as little evident as possible. After careful focusing, a full exposure should be given, in order that the negative may be developed to a good density. Under-exposure produces flat, weak negatives, which are difficult to develop so as to keep the lines clear. In a good light, the average subject will require an exposure of from 30 seconds to a minute, with the lens stopped to *f*/32. A good developer for this kind of negative is as follows: Edinol, 20 grains; sodium carbonate, 100 grains; sodium sulphite (crystals), 100 grains; hydroquinone, 10 grains; potass. bromide, 2 grains; water, 3½ ounces. For use, mix 1 ounce of this with 4 to 6 ounces of water. Another good developer is as follows: Hydroquinone, 24 grains; sulphite of soda (crystals), 144 grains; carbonate of soda, 288 grains; potass. bromide, 12 grains; water, 5 ounces. Dilute if desired.

Clearing: Reducing If, on examination after development and fixing, the dark lines appear somewhat veiled, reduction with a very weak ferricyanide reducer will clear them without affecting the denser parts. This treatment will also help in case of over-exposure or over-development where the fine lines appear blocked.

The ferricyanide reducer mentioned is simply made as follows: Solution No. 1.—Ferricyanide potass. 20 grains; water 1 ounce. Solution No. 2.—Hypo ¼ ounce; water 4 ounces. For use, take ¼ ounce. No. 1 and 4 ounces. No. 2. A weaker solution may be employed if this has too energetic an action on the plate. Note that Solution No. 1 should be kept from exposure to light, in a bottle wrapped with opaque paper. It is best freshly prepared.

Intensification If the negative is not sufficiently dense, a recourse must be had to intensification. After thorough washing, the negative should be bleached right through with mercury and, after another thorough washing, blacken with dilute ammonia solution. From the negative so obtained, the slides are made as already described, by contact-printing or reduction, process plates being employed here also, with the same developer as advised for the making of the negatives. The method here given will work well for wash drawings and halftones, as well as for line drawings and diagrams.

Diagrams: Titles

Diagram slides shown at the average lecture are often amateurish as to the drawing or title shown on the screen. A good plan, where many diagrams or titles are to be used in a lecture, is to have a store-ticket writer make the originals, which can be done at a very slight cost. Effective title slides can be made by lettering the title or descriptive matter in white over an appropriate illustration or photograph, from which the negative and slides are afterward made. Where white lettering is done on a dark ground, the lettering in the slide may be effectively colored by staining the film with the liquid dyes sold for tinting photographs. Do not mix these dyes before applying, but wash them on separately. For example, if green is desired, give a faint wash of yellow followed afterward by a wash of blue, and so on. Diagram slides may be made by hand by simply coating lantern-slide plates with a thin colorless varnish, upon which the design or lettering desired is written or drawn, with pen or brush, according to the expertness of the individual worker.

Slides without a Camera

A novel method of copying magazine and book illustrations, whether in line or halftone, without a camera, for lantern-slide projection was given by Mr. Bernard C. Roloff, in "Camera Craft" some years ago. The method has worked satisfactorily in my practice, and is, briefly, as follows:

Halftones

We will take, for example, a halftone illustration from a popular magazine, which it is desired to use in the lantern. If we were to make a negative direct from this illustration by contact printing, the printing on the back of the illustration would, of course, show through and spoil the result. To get rid of this printed back, place the illustration, face down, on a piece of ground glass or other surface on which it will not slip easily, and slightly wet the back of the print until the dampness shows signs of striking through. Now, with a piece of medium emery paper, gently rub the moistened surface of the back of the print until the ink is completely rubbed off. This may leave a somewhat roughened and hopeless-looking surface. But the application of a finer-grade emery paper, when the print has slightly dried out, will further smooth the surface.

Now beat up the whites of eggs sufficient to make one ounce of albumen, dissolve 3 ounces of gelatine in 1 ounce of water and, when thoroughly dissolved, add the albumen solution, with just enough salicylic acid to preserve the solution—a few drops. This thick substance is lightly smeared on the roughened surface of the paper with a soft wad of cotton or a camel's hair brush. As it dries, it gives a new surface to the back of the print, smooth and finished as before. This preparatory work is not needed except where the illustration is printed on the back.

This done, we are ready to make the negative. If the paper does not appear sufficiently translucent, it may be rendered more so by the application of a little vaseline or Canada balsam. This should be rubbed in until none remains on the surface. The print is now taken into the dark-room and a process plate of the desired size placed over it, film down, as in making a print. With an incandescent gas-mantle, an exposure may be tried at 1 second, and the plate developed in the Edinol-Hydro developer, given above. This direct non-camera method of making slides is, of course, limited to such illustrations as will come within the confines of the lantern-slide plate or mat; but, with careful choice, very effective slides may be had by this method from halftones or line engravings of subjects not otherwise available.

Varnishing

Varnishing of slides is not the general practice which it was when collodion was largely used by amateur slide-makers, since such slides often had a faint opalescence which required a coat of varnish to remove it. While the modern gelatine slides are free from this defect, they are appreciably improved by varnishing, and, as mentioned in a later paragraph, are also thereby rendered less liable to "dew" in the lantern.

Various cold varnishes may be made or purchased for slides, so that the manipulation is simple in the extreme. The varnish may be applied with a brush or, preferably, by flowing the varnish on and draining off the excess. One very good formula for a varnish is: Gum dammar, 250 grs.; benzole, 10 ozs.

Another, given by Mr. G. T. Harris, is: saturated solution of amber in chloroform, 1½ ozs.; benzole, pure, 1½ ozs.; gum dammar, ¼ oz.

This requires the slide to be gently warmed before applying the varnish, but there are plenty of other varnishes, notably that prepared with celluloid and amyl acetate, which are applied to the quite cold slide.

The worker who values slides which he may wish to retain for years—for example, for lecture purposes—will not omit to varnish them. Unlike negatives, slides in their constant transit are often exposed both to heat and damp, and the alternation of the two is apt to cause changes in the gelatine itself, which may lead to the destruction of the slide.

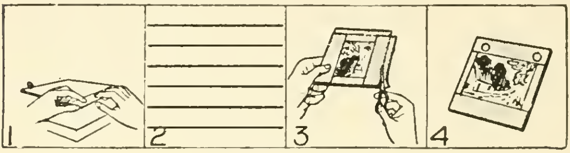
Masks

As soon as the lantern-slide is finished and dry, it needs covering with a cover-glass, masking, and binding—these being necessary for the protection of the picture-film from scratches or injuries by handling, which would, of course, be plainly apparent in the enlarged picture when thrown on the screen.

A lantern-slide mask is simply a piece of opaque paper, usually black needle-paper, cut to the size of the lantern-plate, with a cut-out center through which the picture is seen. This opening in the mask serves to frame the picture when thrown upon the screen, and may be of any desired size or shape. There are many standard shapes of cut-out masks in the market, obtainable from most dealers. But most lantern-slide makers prefer to make their own masks, and so completely control the shape and size of the opening which is to frame the picture. The commercial masks are usually round or oval, or rectangular with rounded corners, or dome-shaped, that is, the opening has square lower corners and a slightly rounded top. The rectangular forms, often with their corners slightly rounded, are most generally used. On the other hand, those who make their own masks use strips of paper of varying width, instead of cut-out forms, thus forming a mask which is square or rectangular. The most convenient commercial mask, or mat, as it is often called, is the Olmsted mat. This is a piece of paper of the size of a slide, but without any opening cut in it. One side is wide, and on this side a number of crossed lines are ruled, so that, by following any set of lines with a sharp knife, any desired shape or size of opening may be obtained. G. Gennert, of New York, also specializes in lantern slide mats with imprints.

The Opening The size and shape of the opening should have careful choice, as the mask practically trims the picture and has much to do with the pictorial effectiveness of the picture on the screen.

The method of masking by strips is perhaps that most satisfactory. There are two ways of doing this. First: Take the ordinary binding strips, which are tough black paper, coated on one side with a strong adhesive, or cut strips of black needle-paper into accurate widths of 3/8 inches, 1/2 inches and 3/4 inches. Now lay the slide, film side uppermost on a white sheet of paper on the table. Be sure that the slide and the mask or paper are thoroughly dried. Moisten the gummed strip of the right width (or paste an ungummed strip) and lay it on the slide, so as to mask off the part required (see Fig. 1). If the white paper under the slide be ruled, as shown in Fig. 2, the lines will help in placing the strip accurately. Repeat this application of the strip of paper along the other three sides, varying the width of the slip according to the size of the opening desired, and trim off the projecting portions with a pair of scissors (Fig. 3). Finally, put two white spots,



Masking Slides with Strips

or discs, on the two upper corners of the mask, and the slide is ready for binding.

The second way is to cut the black masking-paper into strips four inches wide and of any convenient length. Lay the slide on a piece of ruled paper as before. Mark the shape of the opening desired on the film of the slide. A brush carrying a charge of gum or dextrine is now dragged across the film surface of the slide just below the line where the edge of the mask is to come. The end of the paper strip (with a clean-cut edge) is then brought up to the right place, and the paper pressed down on the slide. The slide is then lifted from the table, turned over in the hand, so that the paper is undermost, and the surplus strip cut off with the scissors close to the edge of the slide. If this cutting is carefully done, the end of the strip is ready for applying to the slide for another side of the mask. This operation is repeated until the slide is properly masked, as desired. In this method there is no waste, and the trouble of finding a strip of just the right width is saved.

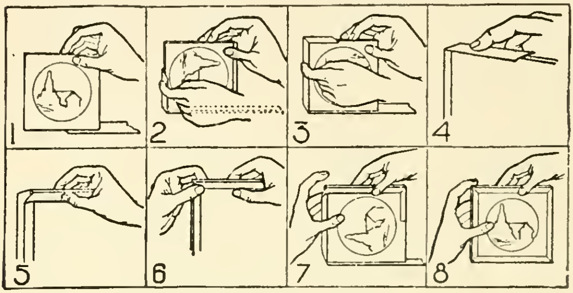
If ready-cut masks are to be used, these should be first adjusted exactly to the required position on the film, and then fastened to the film at the top and bottom with a strip of liquid gum. Numbers, names, or any similar data desired on the slide may be written in black ink on the two white spots, or on a strip of white paper mounted on the mask, or written with white ink on the mask itself.

Binding

The first step in binding the lantern-slide is to prepare the cover-glasses and binding-strips. Cover-glasses of thin white crystal are obtainable from all dealers. Discarded lantern-slide plates, the result of mischance, or masks in making slides, may be used for cover-glasses, if thoroughly cleaned and polished before use. This cleaning means soaking the discarded slide in a hot solution of washing soda; remove the gelatine coating, rinse the plate and immerse it for a few minutes in a five per cent solution of hydrochloric acid. When dry, such clean plates should be thoroughly polished with a mixture of Tripoli powder and wood alcohol mixed to a cream, to which a few drops of ammonia are added. This is smeared on the glass and wiped off, after which the plate is polished with a clean linen rag.

Binding-strips can be had in cut lengths or in rolls, and in paper and book-binders' black cloth. As they vary in quality and have much to do with the life of the slide, care should be used in the choice of a binding strip. If paper strips are to be used, choose a thin, tough, pliable black paper with a strongly adhesive coating. The new cloth binding strips are altogether preferable to paper.

Binding a slide is a tedious bit of work. The secret of success is to have the strip thoroughly limp. First: Lay the strip gummed side down, and thoroughly moisten the back. As soon as the strip is limp, turn it over and moisten the gummed or adhesive side. Now lay the strip face up on a couple of thicknesses of blotting-paper. Place the slide, with its cover-glass in position on the strip, as shown in Fig. 1, and press firmly down. Now turn the slide over on the strip, as shown in Fig. 2, and over again as in Fig. 3, at each movement pressing the slide firmly down on the strip, and running the finger along the edge of the binder so as to cause it to adhere to the slide (Fig. 4). Now press down the sides of the strip firmly against the glass, pushing the top end of the upright strip away from the glass, as in Fig. 5; pressing down the corner to make a neat joint



Binding a Lantern Slide

(Fig. 6); then turn the slide over once more into position, as shown in Fig. 7, and repeat the operations shown in Figs. 5 and 6. Again turn the slide so as to join the ends of the binding-strip and repeat the operations shown in Figs. 5 and 6, which will give a completely bound slide, as shown in Fig. 8. Be sure to rub the edge of the binder firmly down before pressing the sides of the strip against the glass. This should give a slide with the edges thoroughly covered and the paper well pressed home at the corners, so that the binding is everywhere in contact and thoroughly smooth to the finger and thumb, as passed along each edge. There is in the market a little revolving vise, which holds the lantern-slide and its cover-glass in close contact between rubber discs, so that it may be turned and both hands left free for the binding. It is essential that the masked slide and its cover-glass be thoroughly dry before binding. If they are stood up in a draining-rack near a fire or stove for a few minutes before binding, this perfect dryness will be assured. The binding process, slow at first, goes quickly when once mastered.

The Wet Collodion Process

Although the wet collodion process is no longer used in every day photography, it survives in photo-engraving and in commercial lantern-slide making. As practised by those who make lantern-slides for the trade, the process is exceedingly simple in operation and unequaled both in economy (that is, cost per slide) and the certainty with which it gives good slides from negatives which may vary largely in quality. I will briefly describe the process, with the proviso, however, that it is hardly worth mastering except for commercial purposes, or where large numbers of slides are wanted for some special work.

The process is known as "wet" because the glass is coated with a silver emulsion, and before the emulsion is dry the exposure is made and the picture developed and fixed. This means that the slide-maker must also be his own plate-maker. Instead of gelatine, as used in dry-plate film to hold the sensitive silver, collodion is here used for the emulsion.

The Stages First, selected glass is thoroughly cleaned. Usually several slides are made at one time on a large piece of glass. After being cleaned, this is coated with the collodion film and sensitized with nitrate of silver. Then follow the operations of exposure, developing, and fixing, after which the plate is dried and varnished for the protection of the delicate film. As the collodion film is much more delicate in texture than gelatine, care must be exercised in handling the plate all the way through.

Cleaning the Glass Wash the glass thoroughly in a hot, strong solution of washing soda. Rinse well in running water and then immerse for five minutes in a five per cent solution of hydrochloric acid. After a last rinse under the tap, the plate or plates should be polished with a clean chamois leather which has been wrung out in clean water. Around the edges of the side of the plate which is to be coated with the sensitive emulsion, a line should be ruled with a fine brush, dipped in a solution of pure rubber, dissolved in benzole to the consistency of a thin syrup. This edging of rubber solution will prevent the water used during subsequent washings from getting between the film and the glass, and so washing the film away.

Collodion The collodion should be purchased ready for use. What is known as iodized negative collodion is generally employed for slide-making. Iodized collodion matures or ripens with age. At first it is of a pale yellow color, and gradually darkens to a rich ruby-red. A collodion which is three or four weeks old is preferable for our purpose. The beginner should remember that collodion is very inflammable. But, used with reasonable care, there need be no accidents.

Coating the Plate The glass to be coated may be held by its two edges between the thumb and the finger, as in varnishing a negative, or by means of a suction-cup attached to its reverse side. See that no specks of dust are visible on the surface of the plate. Pour a pool of collodion on the plate, and tilt the glass until this pool of collodion has flowed to every corner and covered the whole area of the plate, letting it drain from the corner last covered into a bottle—not the bottle from which the collodion was first poured. Do not let the corner of the plate rest on the mouth of the bottle, as this sometimes produces vibration-marks on the film. This coating with collodion will require a little practice, but very quickly the worker will get the ability to give the plate a thin, even coating of the collodion without spills or difficulty. As soon as the film is "set," so that a finger-mark shows when a corner of the plate is touched, the plate is ready for sensitizing. This "setting" will occupy less than a minute from the coating of the glass, and the plate must be sensitized before any part of the collodion coating becomes really dry.

The Silver Bath

This should be prepared in advance. It is made by dissolving 7 parts of nitrate of silver (recrystallized) in 100 parts of distilled water. Ordinary tap-water should not be used, because of its containing organic impurities. Before the bath so made is used, a small crystal of potassium iodide should be dissolved in it, and the bath should have a slightly acid reaction when tested with blue litmus paper. If it does not turn the litmus paper red on test, drop a couple of drops of nitric acid into the bath and stir it well with a clean glass rod, adding acid drop by drop until an acid reaction is obtained.

The Dipping Bath

This silver or nitrate bath may be poured into a flat glass tray, and the collodionized plate, which is to be coated, immersed in the solution. But a better way is to use the dipping-bath—a narrow, deep glass tank, into which the plate may be lowered. Such baths are obtainable from dealers. The fingers must not be brought into contact with this silver solution. A piece of silver wire is bent in the form of a broad hook, so as to hold the plate vertically, and with this the plate is steadily lowered into the silver solution. Let the plate rest in the silver bath for about a minute, and then during the space of another minute, gently raise and lower it, keeping it all the time entirely immersed in the solution. Now lift it gently from the bath and notice whether the surface appears at all greasy as the surplus liquid flows off. If it does, lower the plate again into the solution, and examine at the end of another minute. The plate should remain in the bath for one minute after all trace of greasiness has disappeared. This sensitizing of the plate is, of course, done in a safe darkroom, and in all subsequent work until the plate is fixed, the plate must be as carefully guarded from white light as in dry-plate negative-making. When the plate is sensitized as above described, stand it for a few moments on a pad of absorbent paper and drain off the surplus silver solution.

The Plate-Holder Special plate-holders are used in wet-plate manipulation. A single plate-holder which has a recessed frame in it, fitted with silver corners, to keep the delicate gelatine film from touching the wooden rebate of the frame, is commonly employed. Of course, it is understood that the plates are exposed immediately after sensitizing them, and then at once developed.

The Exposure The camera is supposed to be ready for the plate, with the negative from which the slide is to be reduced sharply focussed on the screen. Insert the holder with its wet plate in the camera, draw the slide, and remove the cap from the lens. The actual exposure required is, of course, a matter of experience. Roughly, the wet plate will require about double the exposure which would be given to a slow dry plate. For example: In reducing a 4 x 5 negative to half the size for the slide, with *f*/11, and a north light, facing the dark sky at noon, in December, try an exposure of two minutes.

Developers After the exposure, the plate is at once developed. The developer most generally used for wet lantern-slides is the sulphate of iron developer. This should be prepared previously, as follows: Dissolve 120 grains of sulphate of iron in 8 ounces of water; add 10 minims of nitric acid and 40 minims of alcohol. Another standard developer is pyrogallic acid, 10 grains; alcohol, 1 dram; nitric acid, 5 minims; water, 4 ozs. In using, take of this latter stock pyro developer, 1 part; water, 20 parts. Note that for pyro development, the plate needs considerable more exposure than for the iron developer.

Development The exposed plate is held between thumb and finger, as in coating, or placed on the suction holder, which is preferable, and about 3 drams of the developer is poured over it. The plate should be rocked so that the developer flows backward and forward over it, without dripping off the edge of the plate. The free nitrate of silver held in the film united with the developer in building up the image, and if any of the developer flows off the edge of the plate it, of course, carries the silver with it and is lost. The density of the image may be accurately judged, as there is little or no loss of density in the fixing of a wet plate. As soon as the image is sufficiently developed, or the developer becomes coated, rinse the plate under the tap in gently running water. If in development the image comes up quickly and is gray all over, this indicates over-exposure. If, on the other hand, a very weak image comes very slowly, this shows under-exposure.

Redevelopment A collodion plate often develops very thin. The remedy is to strengthen it by redeveloping with the same solution as before, adding, however, a little nitrate of silver solution to the developer, to replace that washed from the film in the previous operations. This nitrate of silver solution is prepared as follows: Take nitrate of silver, 50 gr.; water 1 oz.; nitric acid, 2 drops. For use, add 12 drops of this solution to each 2 drams of the original developing solution used in redevelopment. As soon as the developer shows the slightest signs of muddiness, rinse the plate in gently running water, and develop a third time, if this is necessary.

Fixing Wet collodion lantern-plates are fixed in hypo in the usual way, the hypo bath being made up of 1 part of hypo to 4 parts of water. Fixing will be complete in about a minute, after which the plate should be carefully washed in gently running water.

Toning Wet collodion slides give very pleasing tones. The simplest toner is made up as follows: chloride of platinum, 2 gr.; nitric acid, 2 drops; water, 4 ozs. Pour this solution into a dish and immerse the fixed and washed slide in it. The tones will range from brown to black. A pleasing warm black tone may be obtained by flowing the plate (as in developing) with a solution made up as follows: chloride of gold, 1 gr.; water, 8 ozs.

Varnishing The collodion film is so tender that it is well to varnish the finished slides as soon as made. Any good commercial "crystal" varnish may be used, or a clear varnish made by dissolving gum sandarac, 1 part in 25 parts of benzole. Needless to say, this varnish, as well as the collodion, should be kept away from any lights, as it is very inflammable.

News and Comment

Ansco Company Offers $5,000 for Photographs of America's Lovely Women. This is the first announcement of a contest of the highest interest to both amateur and professional photographers. It not only affords the opportunity to win a substantial cash prize, but to gain considerable publicity by having your photographs exhibited to admiring audiences, composed of thousands of people from all parts of the country. The purpose of this contest is to secure portraits of fifty of America's loveliest women, to be exhibited by Ansco Company at the Panama-Pacific Exposition, in San Francisco.

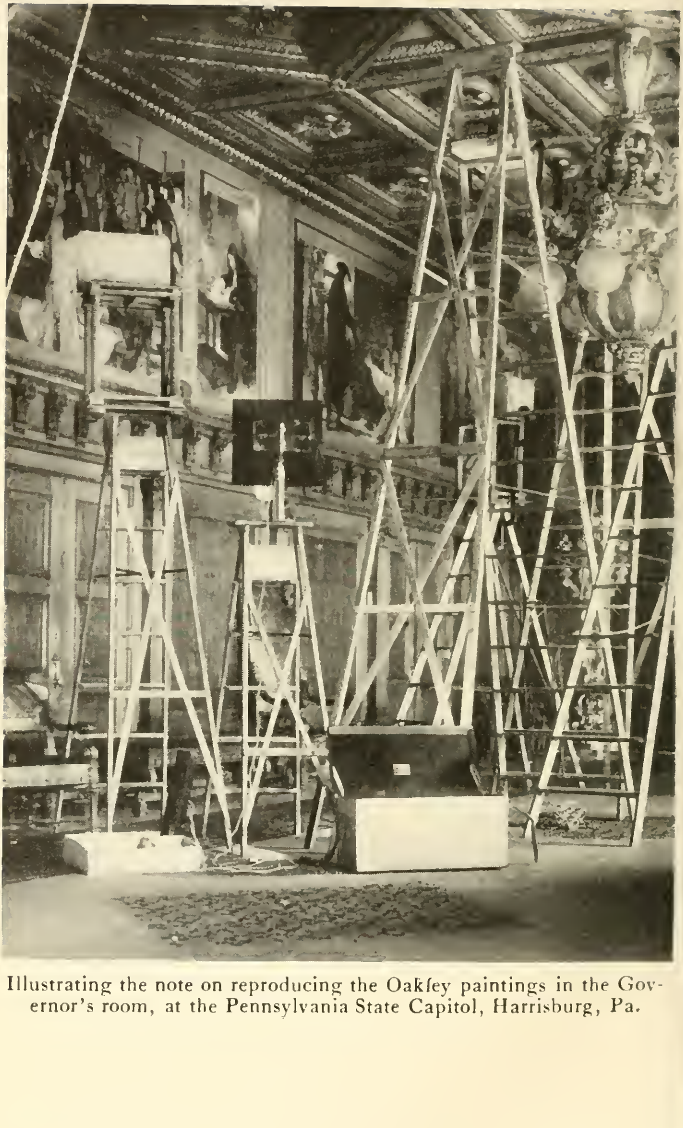
Fifty photographs will be chosen in all, and prizes totaling $5,000 will be distributed as follows:

First prize, $500; second prize, $450; third prize, $350; fourth prize, $250; fifth prize, $200; twenty prizes of $100 each; twenty-five prizes of $50 each.

The selection of the winning photographs will be made by three impartial judges, chosen for their special ability to appraise true feminine loveliness.

This contest will, undoubtedly, create national interest, and it will afford a real opportunity for enterprising photographers to profit by it. To promote this national interest, Ansco Company will extensively feature the contest through advertising in the leading publications. In succeeding issues of THE PHOTO-MINIATURE additional plans, to give photographers greatest benefit from this contest, will be fully outlined. This special assistance to be rendered by Ansco Company will be very effective.

The contest will begin on May 1, and close December 1. It will be open to all professional and amateur photographers, and competitors will not be limited to the use of Ansco goods. Each competitor may enter any number of photographs, taken with any camera,



Illustrating the note on reproducing the Oakley paintings in the Governor's room, at the Pennsylvania State Capitol, Harrisburg, Pa.

and printed on any paper. The full details of the competition are being printed in a special folder, which will be distributed through Ansco dealers.

It does not seem possible to conceive of a contest which would be more interesting to the public at large, as well as to photographers. Husbands, brothers, fathers, mothers and sweethearts will be anxious to have their "Loveliest Woman" represented in the contest, and the "Loveliest Woman" herself will not be backward in having her photograph taken for exhibition.

The plan is exceptionally appealing in itself, and the national advertising which will feature it will be of an extent and character to focus widest attention, and sustain enthusiasm throughout the period of the contest.

The next number of THE PHOTO-MINIATURE will contain more about this contest. Every photographer should read these articles, and use them as a basis for planning his own campaign to profit by this unique and charming competition.

A Notable Achievement in Color-Photography. The Governor's reception room in the Pennsylvania state capitol, at Harrisburg, has been pronounced by competent critics to be one of the most beautiful rooms in the world. Its noble proportions and magnificent lines, its finely wrought wainscoting and richly carved paneling, with the wonderful harmony of color which pervades its parts, delight the eye and fire the imagination. These things, however, are not the chief interest of the room. This is found in the glorious frieze, consisting of fifteen mural paintings by Violet Oakley, which shows the rise and final triumph of the idea of liberty of conscience in the founding, by William Penn, of the Commonwealth of Pennsylvania. It were idle to attempt any description in words of the charm and beauty of this cycle of historic events, portrayed in colors at once soft and subdued yet glowing with life. Perhaps one may compare it with the Grail Cycle painted by Abbey for the Boston Public Library, without Miss Oakley's work suffering by the comparison.

A few weeks ago the Philadelphia *Public Ledger* presented its readers with a series of clever reproductions, in color, of six of the pictures here noticed. The production of the original color reproductions from which the *Ledger's* engravings were made was the work of Mr. J. Wesley Allison, of Allison & Hadaway, 235 Fifth Avenue, New York, and deserves record here as a notable achievement in color-photography. In this work the problem of illumination was the supreme difficulty, together with the securing of absolute focus and registration in the color separation plates required by the engravers. The accompanying illustration shows part of the photographic equipment and the means employed to make the reproductions. After the first experiments, it was found that an exposure of five hours would be required to secure correct color luminosity and tonal values. This being impracticable, Mr. Allison devised a scheme of illumination, combining the use of Panchroma Flash Powder and the Panchroma Studio Lamp, which gave the desired quality and volume of illumination required to bring the exposure within practical limits. The light thus made available was equal to 5,000 c.p. intensity, and gave color records of marvelous fidelity to the original paintings.

Mr. Allison has done some remarkable things in color-photography during the last few years, in portraiture, and other special branches. But it may be said with truth that he has never accomplished anything worthy of greater praise than these reproductions of Miss Oakley's paintings.

A few days ago, I had the pleasure of a call from Mr. Miles Greenwood, Melrose, Mass. It was a pleasure to hear that the individual service which Mr. Greenwood offers to amateurs in the developing and finishing of their pictures, enlarging, and the like, with expert advice, has proved a very real success. Mr. Greenwood's plan is to limit the amount of work he will undertake, so that every client's work can have his personal supervision and attention. This means higher prices than those charged by "the nearest dealer;"

but it also means a very different quality in the results. And it is really worth while to pay a little more to get the best your exposures will give. I suggest that readers who are critical as to their work should get in touch with Mr. Greenwood.

The moving picture is steadily coming within the reach of the amateur and professional photographer. Those who want to see the moving-picture cameras and apparatus already available should send to Burke & James, Inc., Chicago and New York, for their Catalogue A, Projection Apparatus, which lists and describes these specialties.

For a complete pocket-camera outfit, the Goerz V-P Tenax, with its development tank and automatic enlarger, is about as desirable as anything of the sort in the market. The pictures given with the V-P Tenax measure 1¾ x 2⅜, a very desirable memo size. The tank is a beautiful bit of construction work, nickel-plated, and takes twelve plates at one loading. The automatic enlarger can be had for prints 5 x 7, or for prints 3½ x 5½, or in a model giving three different sizes of enlargements up to 5 x 7 inches. An illustrated descriptive folder of this outfit can be had from the Goerz American Optical Company, New York.

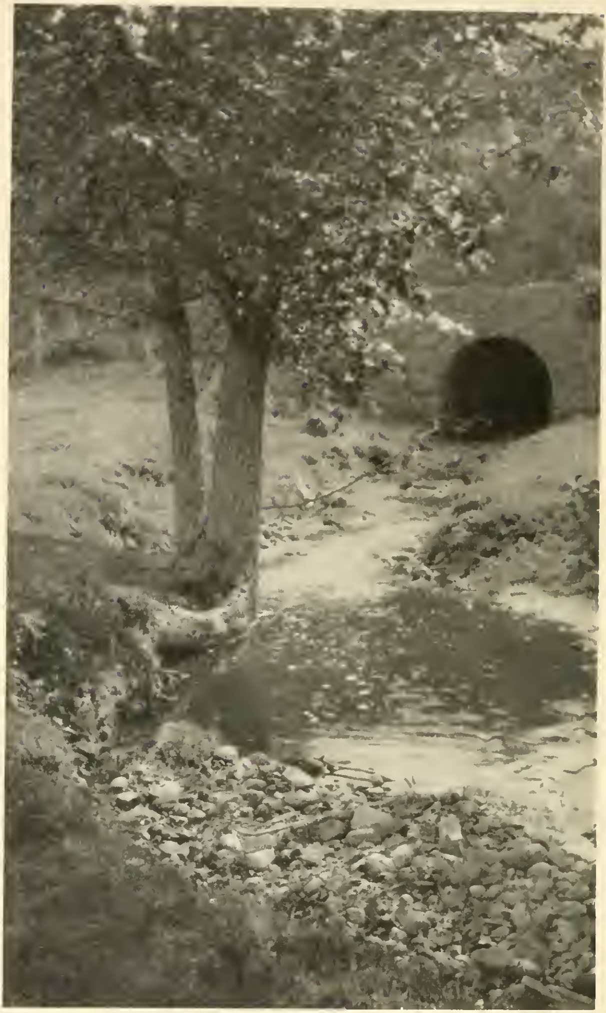
Our daily mail brings us an increasing volume of inquiries about albums. We are glad to see that the album habit is growing. The album means continual pleasure and satisfaction for the photographer who uses it. There are hundreds of different sorts of albums at a variety of prices. We suggest that any reader of this note who wants just the right album for his 1914 prints should ask his dealer to show him the Royal Albums, and not to accept any other make until he has seen the Royal line. We note, by the way, that the firm name of F. L. Schafuss Company, makers of the Royal Albums, has been changed to Farron S. Betts.

Mr. Betts has been for many years the head of the Schafuss Company, so that the change is merely a change of name.

The directions for the use of the Assur color-medium have been modified as follows: Instead of rubbing up a small quantity of the desired color with a little color-medium, the worker is now advised to dissolve 60 to 100 drops of color-medium in 1½ ounces of turpentine, and to use this solution for mixing the colors. This gives more certainty as to the quantity of color taken up in manipulation, and simplifies the application of the color, thus helping in securing more uniformly pleasing results than were possible aforetime.

The Cleveland Photographic Society (formerly the Cleveland Camera Club) announces its Annual Exhibition to be held at the Case Library, April 13 to 25. Those desiring to exhibit should at once apply to the secretary, Mr. A. D. Williams, P. O. Box 102, Cleveland, Ohio. The Cleveland Exhibition is one well worthy of the attention of pictorial workers.

The new Record Plates imported by Allison & Hadaway, 235 Fifth Avenue, New York, are creating quite a sensation among those who have used them. These plates have a speed of 500 H. & D., which means that they are the most rapid plates at present available. Despite this extreme speed, which is a very big advantage in many classes of work, the Record Plate is peculiar in that it has very considerable latitude and works without fog, two qualities which rarely are associated with extreme rapidity. A sample box of these plates, 3½ x 2½ can be had postfree for 35 cents; 3¼ x 4¼, 45 cents, from the importers.



A simple landscape that fitted the long, narrow post-card shape
Charles F. Rice

531

The Photo-Miniature
A Magazine of Photographic Information
EDITED BY JOHN A. TENNANT
Volume XI MARCH, 1914 Number 131

Simplified Photography

"Photography with the bother left out" is a famous catch-phrase familiar to everyone who reads this, for as the slogan of the Eastman Company it has appeared in Kodak advertising the world around. The phrase means the same as "Simplified Photography," and that is why particular attention is called to it here—because it typifies the change from complexity to simplicity that has been brought about in photography during the past twenty-five years.

In the days of the old wet-plate, instead of the bother being "left out," photography was mostly bother. That period, I must admit, was a little before my time, but I have listened with interest to a veteran photographer's account of his wet-plate practice. It must have been difficult enough and fussy enough to make photographs in the studio—with everything conveniently at hand. Wonderful it is, indeed, that in those days there were amateurs who, for the *fun* there was in it, would venture afield with all the numerous and bulky paraphernalia that the process demanded. The darkroom and chemicals had to be taken along with the camera, for the plate had to be sensitized immediately before exposure and developed immediately afterward.

Today, there need be no darkroom; and, instead of a horse and wagon to transport his photographic baggage, the amateur can conceal the loaded camera in his pocket—yea, verily, in his vest-pocket—and withal, this compact and convenient outfit would put to shame the van-load of stuff with which Brady photographed the Civil War.

What excuse is there for a book, even a little book such as this, if photography *has* been made so simple—and so botherless? *If* photography is now so simple and attractive, why is it that the Christmas camera should so often and so soon find a permanent place on the shelf or in the garret?

Answering both questions at once, let us say that, while photography has certainly been made wonderfully simple compared to what it was once, there are still some things that bother the amateur. And it is the hope of the writer, who has been through the mill, by drawing on his own experience and the experience of others, to touch on various problems in a new way or a different way—though they have been much written of—which will lead to a keener realization of the possibilities and limitations of "Simplified Photography," and coax the aforesaid Christmas camera off the shelf or out of the garret.

Film versus Plate

Roll film has been one of the chief factors in the simplification of photography. When wet plates were the only ones and dry plates were introduced as an improvement, there were many photographers who scoffed at the innovation. However, the dry plate won, and came into universal use. So when roll film was invented there were scoffers. A few of them still survive who declare that film is unfit for serious work. But the fact remains that film—first used for amateur photography, and now the medium employed for probably nine-tenths of amateur work—has superseded or is superseding the dry plate in many departments of photography. There are some points in which plates are superior to film, as we shall see, and so it is a question whether film will ever entirely take the place of plates; but there are many points in which film is so far ahead of plates that there is no comparison. Film is light, compact, non-breakable; and in the daylight-loading cartridge form is the ideal ammunition for all picture-making, professional or amateur, that is done out-of-doors, or away from home, wherever the photographic outfit has to be carried about. The professional portrait studio has hitherto been the stronghold of the glass plate, although film has shown its efficiency in work done outside the studio—such as home portraiture,—but now must the plate look to its laurels, for flat cut films have invaded the studio.

Choice of a Camera

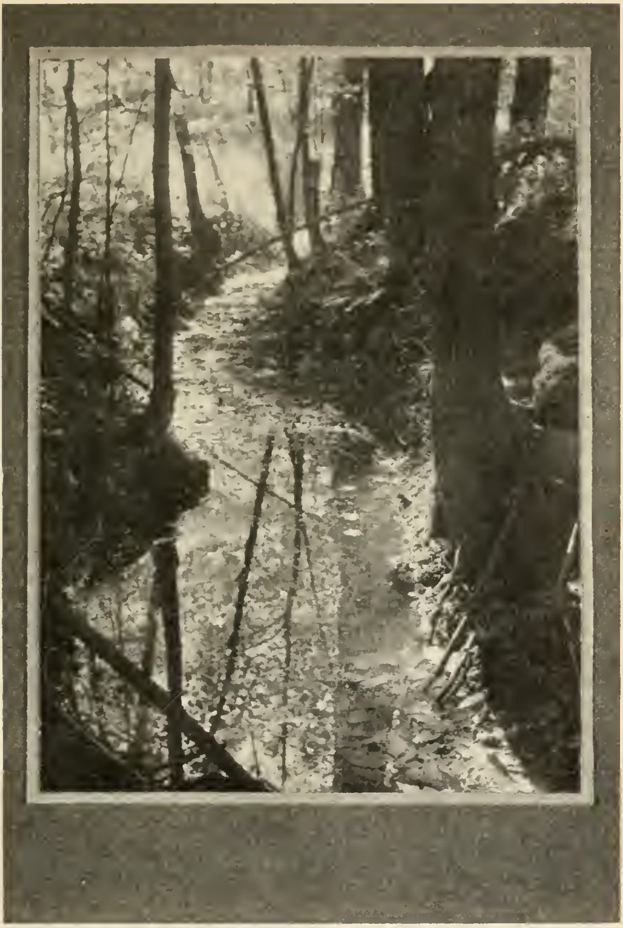
"What camera shall I choose?" The answer depends very much on who you are, how much money you are willing to pay, and to what uses the camera is to be put. There is no one camera that will answer all requirements, so far as I know. When my little boy, of nine summers, asked me this question I gave over my No. 2 Brownie to his use. Last summer, my niece invited me to select a camera for her, and I recommended a No. 1 Folding Pocket Kodak. Just recently I bought a camera for "home consumption," as it were—for the occasional use of the good wife, and the boy who had about outgrown the Brownie; and my choice was a 2¼ Folding Ensign Jr. with rectilinear lens.

Brownie No. 2 was chosen for the nine-year old boy because of its simplicity—here's where "simplified photography" comes in, you see. I know of no camera that is so easily capable of good pictures as this simple box-form Brownie. No. 1 would have answered for him just as well as the No. 2; perhaps better, for the square form of picture has some advantages over the oblong shape, the film costs less than that for the No. 2, and the price of the camera itself is only half as much—one dollar gone instead of two, in case the youngster dropped it overboard. But he didn't drop it overboard, and he took good pictures on the first roll of film. Imagine a nine-year-old successfully taking photographs in the old wet-plate days!

Why did I choose a No. 1 Folding Pocket Kodak for my niece, and a 2¼ Ensign Jr. for household use? Both cameras take the same size picture, both sell for the same price; there are other points of similarity between them, and one camera is not more difficult to operate than the other. Well, I'll tell you frankly, I think you get more for your money in the Ensign than you do in the Kodak at $10. But there are other things to consider. The young lady was about to take up her residence in Porto Rico for some months. If anything went wrong with her camera, I knew she could find a Kodak dealer there—for they are all over the world—who would see her out of the difficulty, and perhaps loan her another No. 1 Kodak while her own was being fixed. The same could not be said about some other makes, however excellent they may be in practical efficency at about the same price. I judged that what was true of Central New England, where my niece lived, would be doubly true of Porto Rico.

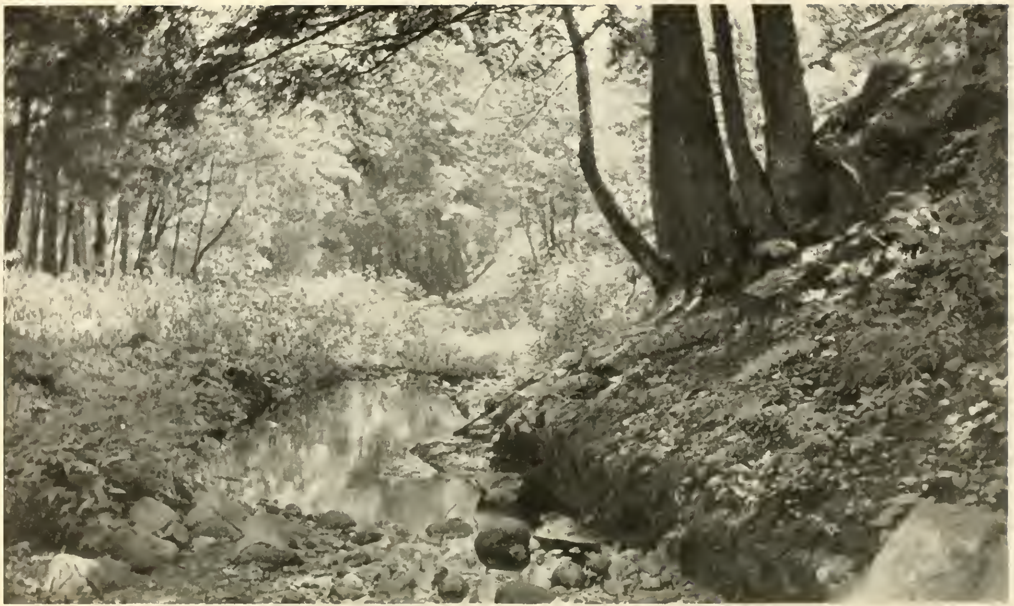
Beyond these simple models there are many more expensive cameras, which offer all sorts of conveniences and wonderful possibilities in certainty of results. Where price is not an object, the modern pocket camera of the fixed-focus form, with an anastigmat lens and a shutter for speed subjects up to 1-300 second, is, of course, preferable to the less expensive models of limited optical capacity. The No. O Graphic camera is perhaps the last word among these advanced models and has a focal-plane shutter.

It may be an Eastman camera that fits your needs best, or an Ensign, or some other make. New models are coming out all the time, and perhaps, if I am choosing a camera next year, it will be an Ingento, an Ansco, an Ernemann, a Polygon, a Tenax, or an Ica. The Ensign is British-made, the Ica, Ernemann, and Polygon are "made in Germany," the others are American. There's no magic in any particular name on a camera, nor in where it is made; both good and bad cameras are made in Europe, as well as here. But mark this point—there's reason for having faith in any line of goods that is widely and persistently advertised. An advertisement amounts practically to a written guarantee, and it has to be a good article—be it a camera or a brand of soap—that can long survive such a test. Wide distribution and standardization make for simplicity and convenience, and it is a comfort to know that wherever you see the "Kodak," or "Ansco," or "Ica" sign—in New York or Timbuctoo—there you can get photographic goods with which the whole world has been made familiar, through advertising.



A bit of wood and water which called for the use of an exposure meter. Exposure three minutes, lens at *f*/16, deep yellow filter, instantaneous Iso plate, double coated.

Charles F. Rice



Exposure 1 second, *f*/8, Eastman film, R. R. lens

Charles F. Rice

Plates Versus Films

Plates, I have said, are in some respects superior to film. These points of superiority are fewer than they used to be, and perhaps in time film will be produced that is in all things equal to plates. But, at the present time, there are plates that are more sensitive to light, therefore faster than the fastest film; and in these two-miles-a-minute times speed is an important factor. Then there are plates slower than film and better adapted to certain special purposes—such as copying, photo-mechanical work, etc., where such qualities as fine grain and clearness are more essential than speed. And for the faithful reproduction of color values there are plates that are better qualified than film. Plates, it will be seen, are made in numerous grades for various special purposes; while film, generally speaking, comes in one grade only; though that one grade of film is as good and capable for all-round work, for which it is intended, as any one brand of plate.

Cameras for Films and Plates

It is desirable to have one camera that may be used for either plates or film, as the case demands. This may be done in one of two ways. The filmpack can be used in a camera primarily intended for plates, in an adapter of about the same size and shape as a plate-holder. Or plates may be used in a roll-film camera, by means of a different form of adapter. Of the two, I should choose a roll-film camera. Plates are always the same, and work as well in an adapted roll-film camera as they do in a camera built for plates. But filmpack, though made of the same material, is essentially different from roll film in its manipulation; and, while the pack is even more convenient than the roll-film up to the moment of exposure, from that point the roll film is superior—in freedom from marks and ease of manipulation. Roll film also presents a flatter surface than filmpack when the larger sizes are carried, and that is important in these days of lenses working at *f*/4.5.

The Expense of Speed

Speed is the expensive part of photography. No. 1 Brownie makes a picture 2¼ inches square on roll film, and the camera sells for one dollar. Exactly the same size picture is made on the same sort of film by the Icarette camera, which, with the fastest lens and shutter fitted, sells for $64—and is well worth the money! Some of the difference in price between the two cameras is accounted for by the difference in construction; but actually about $50 of the value in the $64 camera goes into the lens and shutter. Yet, the one-dollar Brownie would do almost as well as the $64 Icarette if there were no hurry about taking the pictures—if we could always give a long exposure with the Brownie, through a very small opening in the lens. The difference in effective speed of the two cameras is almost exactly in proportion to the difference in price, for with the largest opening in the IC Zeiss-Tessar lens of the Icarette we can get as sharp a picture as we could with an opening in the single achromatic lens of the Brownie, so small as to allow but 1/64 as much light to reach the film. The simplest and cheapest lens will make a sharply defined picture if it is used with a small enough opening. A more complex form of lens, called a rapid rectilinear or aplanat, demanding greater care in its making, and therefore costing more, can be used with a larger opening. A still more elaborately constructed and more finely corrected lens, known as an anastigmat, made from a special kind of glass, and calling for the most painstaking care and the most skilful labor in its production, can be used with a very large opening and still give sharp pictures. The larger the opening in the lens, the more light passes through in the same time, and the quicker the image is impressed on the film. Highly skilled labor is well paid, and optical material of the finest quality costs, therefore the reason is plain why high-speed lenses are expensive.

From the foregoing, the reader must not infer that satisfactory pictures cannot be made with an inexpensive camera. The simple lens in the Brownie type of camera is capable of taking very good "snaps" in bright light. And, if critical sharpness be demanded in the picture, the Brownie will give that too, by using a small opening in front of the lens—with a much longer exposure, of course.

Am I helping you toward the selection of a camera? Let me be more specific.

The Simplest Camera

For the youngster of either sex, the Brownie, Buster Brown, 2¼ Box Ensign, or similar camera is just the thing. It is simple, easily understood, not likely to get out of order even with some rough handling, not so expensive that the family would go into mourning if it should get lost or smashed. Best of all, these simple cameras will take good pictures. Even an older person will do well to start his photographic practice with this simple box type of camera. It will afford a better means of learning the rudiments than a more elaborate and complex outfit. Thorough mastering of first principles with the simple box camera will lead to intelligent selection of a more capable equipment. Or it might turn out as it did with a friend of mine, who got so used to his Brownie, and was so well satisfied with the pictures he took with it, that he decided a better outfit was not necessary.

Having outgrown the Brownie, what then?

The Pocket Camera

Don't think that it is necessary to have a large camera! Very small cameras are now available that are as capable as the largest. Since enlarged prints of such excellence may so readily be made from very small negatives, mere size signifies nothing but weight and bulk and inconvenience—the very things that "simplified photography" seeks to avoid. There is a delightful little book on Pocket Camera Photography in THE PHOTO-MINIATURE, No. 125, which explains the wonderful possibilities of these little instruments better than I can in my restricted space here. The largest size I would recommend for an amateur; is 3¼ x 4¼ and, you can depend on it, a camera as small even as that will often be left at home, and good pictures missed, when a smaller one could be carried in the pocket without inconvenience. I am personally very enthusiastic about the very small, very efficient cameras that have been developed within the past few years. I have worked with them a great deal, and I know many things can be done with them that cannot be accomplished with a larger camera. There is much significance in the growing tendency to use small cameras for all sorts of photographic work—producing the finished print by enlargement.

Two Popular Sizes

The 3A or post-card size, 3¼ x 5½, is probably the most popular camera among amateurs. A close second is the No. 1A, 2¼ x 4¼, which has about the same proportions, both being long and narrow. I have worked with both, and honestly I don't like them. I will tell you why. Having occasion to look over my 3A negatives, some time since, I took particular notice that nine out of ten of the negatives would lose nothing of the real picture by having a half-inch cut off each end. About the same proportion of the negatives would have been better for a somewhat more generous width. In other words, the average view does not come within the long and narrow shape. This, however, is a matter of individual opinion and preference. I prefer to work with a camera making a picture that is more nearly square—like the 3¼ x 4¼. With a 5-inch lens on a 3¼ x 4¼, just as much of the view is included the long way of the picture as with a 6½-inch lens on a 3¼ x 5½. It is much easier to trim off the sides of a 3¼ x 4¼ when the picture is suited to the long narrow shape than it is to piece a little on to the sides of a 3¼ x 5½ when it is not so suited.

Some Comparisons

"Not how cheap, but how good," is a motto I have seen somewhere. It is an excellent rule to apply in the selection of a camera, although your final choice may be a compromise between what you would like and what you can afford. Box cameras have the advantage that they are always ready for action, without any preliminaries whatsoever; but they are bulky, and this want of compactness is a fatal defect. For general usefulness and convenience, no form of photographic apparatus is better than the folding roll-film camera, of which the Folding Pocket Kodaks are typical. There are several other makers who produce cameras almost exactly similar—Ansco and Ingento are names of familiar American types. Among the European lines available in this country may be mentioned the Sylvar, Ica, Polygon, and Ernemann (German), and Ensign and Butcher (English). The house of Goerz also has roll-film models on the F. P. K. style, also a new V. P. Roll

Film Tenax this year. With rapid rectilinear lens and all necessary adjustments, cameras of this type may be obtained from $17 up. Whatever type of roll-film camera is chosen, make sure that it is one for which a plate-adapter is regularly supplied; also that a more efficient type of lens and shutter may be fitted without expensive alterations. The plate-adapter might well be purchased at the same time as the camera, as it is quite likely that some time you will want an anastigmat lens, when you come to realize how much superior it is to the ordinary rectilinear. Among folding cameras for plates and filmpack there is a large range of choice. The Sylvar, Sylvex, Premo, Tenax, Graphic, Radiar, Alpine, Ernemann, Polygon, and Ica models may be mentioned as well-known cameras of this type. In compactness, these compare favorably with the roll-film cameras except that plate-holders or plate-magazines necessarily add to the carrying bulk and weight for outdoor work. These disadvantages are largely overcome by the use of the filmpack and its adapter.

If your purse is long, some dealer will likely enough try to talk you into buying a reflecting camera, or one of which the focal-plane shutter is an integral part. The Graflex is the best-known American reflecting camera and is a remarkable camera for certainty in results as well as for range of efficiency. It is made both for film and plates. Others are the Heliar Reflex, Ensign Reflex, etc. Speed Kodaks are not reflecting cameras, but they have a focal-plane shutter. Whatever make of camera be chosen, it is wise to go as far as your purse will allow, as the efficiency and result-getting possibilities broaden as the price goes higher.

Why Exposure Puzzles Correct exposure is the most important factor in making photographs—in fact, the key to success; but it is a bugbear to the beginner, and frequently a puzzling problem to the more advanced worker. Correct exposure depends on the strength of the light, the speed or sensitiveness of the plate or film, and the size of opening in the lens. After these have been calculated together, the ability to give the correct exposure, if it is less than ¼ second or so, depends on the accuracy of the shutter. Strength of light may vary from what, in a dark interior view, may require an exposure of half an hour, to the scene in blazing summer sunlight that can be impressed on the film in the thousandth part of a second. The latter exposure is only 1-1,800,000 the duration of the former. Small wonder that, between such extremes, one's judgment is taxed to correctly estimate the brightness of the light. Some veteran photographers can do it, though, with surprising accuracy. Safer for most of us is the guidance of an exposure meter, or some sort of exposure calculator, of which many have been devised. The meter, or similar contrivance, provided with sensitized paper, is more reliable because it actually measures the strength of the light. Exposure tables afford a fairly safe guide, but they leave a good deal to individual judgment. If one begrudges the price of an exposure meter, there has been devised by Mr. Steadman, and used by him with great success, a way of testing the light with Solio; any other kind of printing-out-paper will do as well. The idea is to expose the sensitized paper through a hole in an opaque paper or cardboard—the cover of a note-book is suggested—to the light that falls upon the subject to be photographed, and to take note of the number of seconds or minutes required for the sensitized paper to be just barely darkened to the "least visible tint" by the light through the hole. That time will be a certain multiple of the exposure which the subject requires. With a regular exposure meter, the procedure is very similar. Specially prepared sensitized paper is exposed through a slit in the dial until it darkens to the same depth as a standard tint. Then, by turning disks until the number of seconds it took the paper to darken stands opposite a certain other number corresponding to the speed of the film or plate, the required exposure is indicated without further calculation.

Exposure in Practice

How does it work out in practice? On a hazy, bright November day, I tried the light both with the Wynne exposure meter and by Steadman's P. O. P. arrangement, for three subjects—a snap-shot in the open of a boy tossing a ball, a portrait on the piazza, shady side of the house, and an interior. At 1 P.M., it took the paper in the exposure-meter tint 4 seconds to darken to the standard tint when exposed to the direct rays of the sun. This was for the snap-shot. For the outdoor portrait, in the shade, at 2 P.M., it took 12 seconds; and for the interior, at 2.30, it took 16 minutes for the paper to darken. In each case, the P.O.P. darkened to the least visible tint in about one-half the time taken by the exposure-meter paper to match the standard tint. I also consulted the monthly exposure-table published in one of the photographic magazines, with the result that the exposures to give were indicated as follows:

	Snap-shot	Outdoor portrait	Interior
Exposure meter and P. O. P.	1/8 sec.	1 sec.	32 sec.
Exposure table in magazine	1/6 sec.	2 sec.	. . .

This was calculated for stop *f*/16 and Eastman film.

Stops and Exposures

The following table gives the comparative exposures necessary to give various *f* and U.S. stops, or lens openings, taking one second at *f*/8 (U.S. 4) as the basis of calculation:

Opening in lens—							
f/4	*f*/6	*f*/8	*f*/11	*f*/16	*f*/22	*f*/32	*f*/45
U.S.1	U.S.2	U.S.4	U.S.8	U.S.16	U.S.32	U.S.64	U.S.128
Relative exposure—							
1/4 sec.	1/2 sec.	1 sec.	2 sec.	4 sec.	8 sec.	16 sec.	32 sec.

Single achromatic lenses, such as are fitted to the simplest and most inexpensive cameras, like the Brownies, usually have *f*/16 as their largest opening. *f*/8 is the maximum aperture for the rectilinear lens, while the anastigmats have still larger openings, ranging from *f*/6.8 to *f*/4.5. Tiny anastigmat lenses used for taking motion pictures work at *f*/3.5, which is eighteen or twenty times as fast as the *f*/16 stop of the Brownie or Buster Brown.

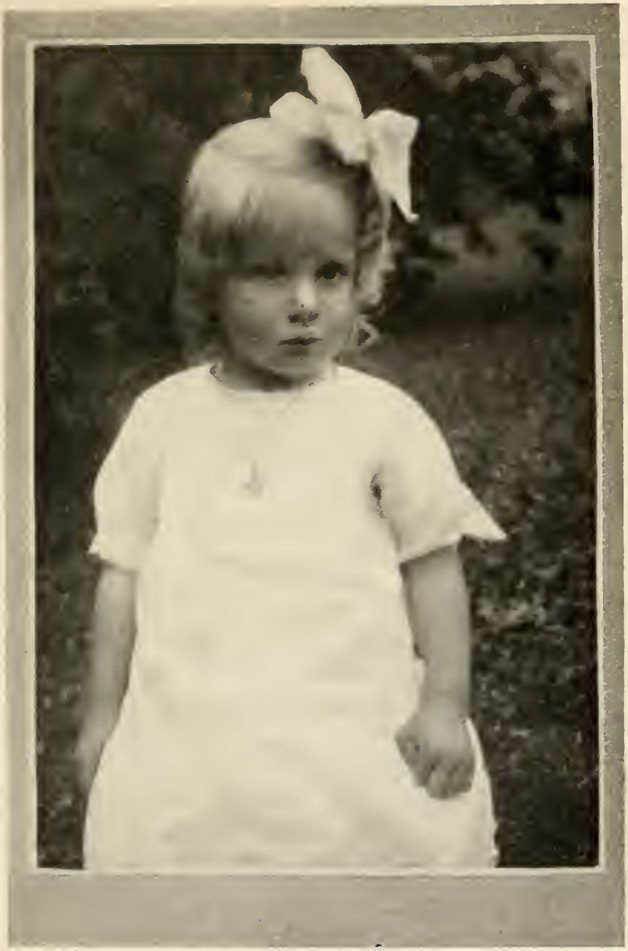
Instantaneous exposures cannot be made with any degree of certainty unless the shutter is tested. For those whose camera shutters have but one speed of instantaneous exposure this does not so much matter, although even then it is well to know how near the actual exposure corresponds to what is found to be the correct exposure. I have tested shutters, roughly, by means of a revolving bicycle wheel, with a narrow strip of white paper glued around the tire. When the pedals were turned twice a second, I figured that the white band on the circumference of the wheel ought to make nearly a quarter of a revolution in 1-25 second. I photographed the revolving wheel with three different cameras—each having a different type of shutter: No. 2 Brownie, 2¼ Ensign Jr., and 1A Folding Pocket Kodak; the shutter on each of which had but one speed of instantaneous exposure. The results showed that the snap of all three shutters was a little slower than 1-50 second.

What are you going to do about it, if you find the slowest speed your shutter works is, say, 1-40 second, that its largest lens opening is *f*/16, and both exposure meters and tables agree that on a bright November day ⅙ to ⅛ second is the right exposure to give? You may do one of the three things: leave the camera on the shelf and not attempt any pictures, or take a tripod along and make only time exposures, or go ahead with your snap-shooting and rest assured that they will all be under-exposed. That is where the anastigmat and better shutter are of practical advantage.

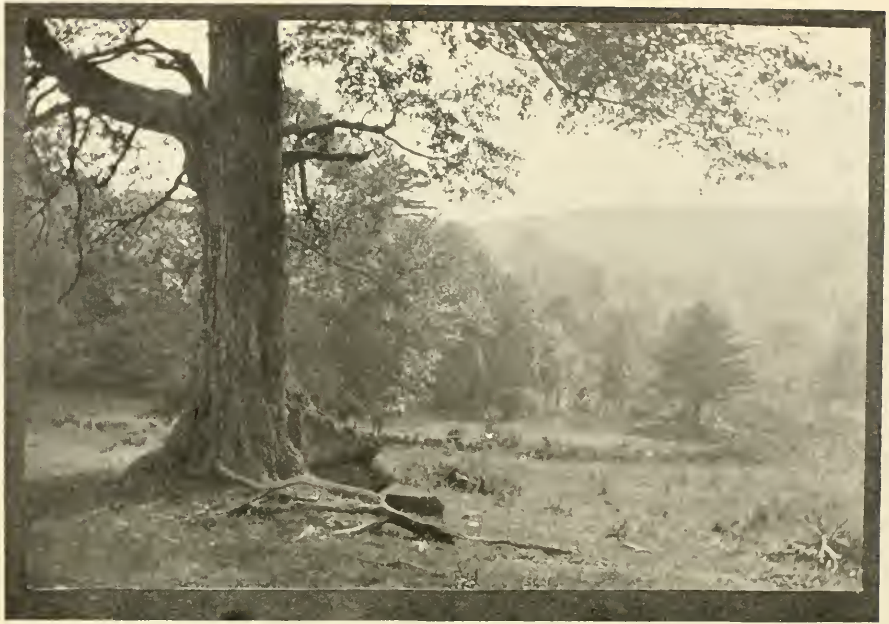
"And is this Simplified Photography?" you say. It doesn't seem so, I confess; but if you think it over, you will see that I am trying to simplify it a little by helping you to realize just where you are at on this exposure question. I might go on and fill a good-sized book about exposure problems, and even then not exhaust the subject. If you would learn a good deal more about it than can be said here, get and read THE PHOTO-MINIATURE, No. 105, entitled "Correct Exposure." In any event, if you have a camera, get an exposure meter to go with it. Remember, while our photographic forebears had no such guide and *had* to guess, for us there is a better and simpler way. Use an exposure meter or calculator.

First Attempts: Portraits

Pictures of people—portraits—are usually and naturally the first subjects attempted with the newly acquired camera. I well remember the initial stage of my "portrait" work, when I backed a friend



Outdoor portrait, enlarged from an Icarette negative.
1/5 second, cloudy day
Charles F. Rice



A portrait attachment here gave me a wider view angle. The hazy background increases the effect of distance

Charles F. Rice

up against the side of a house, bade him "look pleasant," despite the sun shining full in his eyes, while I proceeded to do my worst. And it *was* about the worst way anyone could set about taking a portrait. I didn't know any better, but I soon learned, by experience—the best teacher.

The professional portrait photographer, as he works in his studio, uses such apparatus and accessories as are made especially for the purpose. Even the room is designed and constructed with especial regard for the purposes for which it is intended. These implements and surroundings are entirely foreign to the amateur photographer, with his simple and inexpensive camera and no accessories whatever, and it seems to me the amateur will do well not to copy the methods of the professional and in any detail.

The Exposure

Various articles such as screens, shades, reflectors, vignetters, painted backgrounds, etc., are common properties in the studio. We can do without them altogether, using simply the camera and a tripod or other stand, if we take our portraits out-of-doors—either on the piazza or entirely away from the house. Exposure considerations are all in favor of working outdoors, especially with $f/16$ as the largest available lens opening. Exposure-meter tests, consultation of exposure tables, or actual trial with the camera, will show four to eight seconds to be as little exposure as we can get along with, indoors, at $f/16$, by ordinary window-light, when the sun is shining brightly outside. Such an exposure is too long for portrait work if it can in any way be shortened. On the piazza, one second or less is usually enough; and in a shady spot away from the house the light may be bright enough for as quick a time exposure as we can give—a quarter of a second or so.

Square-box Brownies and other fixed-focus cameras will not give sharp detail if the subject is nearer than eight or ten feet; and this will give the figure or face too small for satisfaction. For portrait work with them, that is, for bust portraits, it is necessary to have a supplementary lens called a portrait attachment. This costs but fifty cents, and fits on in front of the regular lens, making the distance of sharpest focus 3½ feet. Some delightful portraits have been made with these inexpensive attachments. The portrait attachment may also be used with focusing cameras, although some of the latter, without any supplementary lens, will focus by scale down to three feet—which is surely near enough for portrait work. In fact, if the focus can be set for six feet, that will be found to give the subject's features in truer proportion than a less distance; and if the image is too small in a contact print from the resulting negative, it may be enlarged to any desired size.

Lighting the Face

Portraiture demands soft lighting, with no very dark nor sharp-edged shadows. Direct sunlight is therefore to be avoided. But, though the lighting should be soft, it should not be flat—that is, the light should come more from the side than from directly behind the camera, so that there will be a distinctly *light* side and *shadow* side to the subject. This caution is not necessary to give regarding indoor portraiture, where the difficulty is to keep the shadows from being too dark, or even on a piazza where all the light comes from one side; but out in the open we must guard against flatness, and strive for roundness and relief.

Backgrounds

The background is of very great importance. The clapboarded side of a house does not make a suitable background for a portrait, neither does a brick wall nor a picket fence. Masses of vine or shrubbery are frequently very good, if they are not lighted so as to look spotty, and especially if they are far enough behind the subject to be out of focus and therefore indistinct. Other means failing, it may be necessary to provide an artificial background by hanging up a large cloth, such as a blanket or couch-cover or window-shade. But, whatever composes the background, it should be not too dark nor too light, and not "spotty." There is a lot of useful information in THE PHOTO-MINIATURE, No. 126, on individual backgrounds, but it is intended for the advanced worker, rather than for beginners. In spite of this, the amateur may find much help in its pages.

Posing

As to posing, I am inclined to think that the less the subject is posed the better the result is likely to be. Let the sitter assume a natural position and change it as little as possible. Sometimes the hands are bothersome. If they cannot be got out of sight, perhaps they may be occupied by holding a book, or a lady may be photographed in the act of putting on her gloves, or a man filling his pipe, etc.

Groups

Much of what has been said about individual portraits applies with equal force to group pictures. The formal arrangement of groups, in which the people are stood up in rows, like tin soldiers, is more or less distressing. Much better it is, if possible, to picture a number of people as occupied with some matter of common interest—listening to one of the number, or engaged in a game. Direct sunshine is quite permissible for informal groups, which makes instantaneous exposure often possible, and simplifies matters for the amateur. On this subject of groups the reader should see THE PHOTO-MINIATURE, No. 129.

Finally, do not afflict your subjects by endless fussing—adjusting this or that or the other. You should have thought out all these details beforehand, so that your operations may be reasonably quick and sure.

Landscape

Landscape is the branch of photography I love best. Many are the happy hours I have passed seeking to capture the elusive charms of woodland and meadow. I have gone after them with all sorts of cameras, from the little Brownie to the 8 x 10 view camera, and have had some measure of success with all. Speaking along the lines of "Simplified Photography," I am prepared to affirm that the smaller the camera is, the simpler is the task of carrying it. Landscape photography it was that got me into the habit of taking long walks, and the farther I walked the more was I impressed with the burdensomeness of a large camera. So it came about by degrees that the bulky, heavy outfit was left at home, and a smaller camera was taken instead. While I will not say that the small camera gave me better results, it did do the work just as well; and many pictures were secured with the little camera that the larger one would never have reached, because it was too big and heavy to be carried that far.

Simple apparatus is at no disadvantage in the photographing of landscapes. Here the rectilinear lens will answer as well as the anastigmat; indeed, some of the most eminent landscape workers prefer the simple meniscus lens to either the rectilinear or the anastigmat. Microscopically sharp detail is not necessary in landscape photographs. Rising and falling fronts, swing-backs, high-speed and high-price shutters, and all the rest of the complicated luxuries, though they may be sometimes employed in landscape work, are not essential. Even a focusing adjustment, though I should prefer to have it, is not so necessary for landscape photography as it is in other branches.

The Viewpoint

Ability to select the best viewpoint comes only with practice. I hesitate to mention "composition" by name, but the selection of the most favorable point of view necessarily involves the principles of composition, whether so-called or not. Also, it is dangerous to attempt to lay down hard and fast rules in the matter, for many beautiful pictures successfully transgress accepted rules. In such case, the critic must invent a new rule of composition to fit the picture!

A great aid in finding the best point from which to take a landscape is a stiff piece of dark paper or card—an old mount will do nicely—with a rectangular hole cut in the center of about the same proportions as the picture your camera takes. A little practice with this will show you how far from the eye it should be held so that the view seen through the opening will be practically the same as would be included on the plate or film by your lens. This is better than the little finder fitted to the folding camera. For "composing" the view, I think the hole in the card is better even than the ground-glass focusing screen. Not a bad plan is to take the card "finder" out into the fields and woods, and do a lot of peeping and thinking without taking any pictures at all—just trying to see them.

Picture Hints After what I said before about the "rules" of composition, it is with some timidity that I offer the following—*suggestions* we will call them, which are applicable not alone to landscapes but to other views. Bear in mind that "the exception proves the rule," particularly in matters of composition:

The picture should not be divided into two nearly equal parts by a straight line, like the horizon.

One end or side of a view should balance the other, but the two parts should not be exactly symmetrical. If you photograph a house of simple architecture directly from in front, so that the house comes in the middle of the picture, you will see the objection to perfectly symmetrical arrangement.

Interest should be drawn to one point or part of the picture—not exactly in the center of it, nor too near the edge,

Do not include too much—too many scattered objects, nor too wide an angle in the view. This keeping things out can be accomplished either by the use of a long-focus lens, or by trimming of the print. It is better, if confined to one lens, to have it of short enough focus so that it will always include a sufficiently wide angle. Then, if the real picture occupies only a small part of the negative, an enlargement may be made from that part to any desired size.

For roundness and relief, the view should be lighted from the side, rather than from directly behind the camera. Very strong relief—almost a stereoscopic effect—is obtained when the light comes from the front. With this lighting, the lens should be shaded from direct rays.

Lights and shadows are strongest in objects nearest the camera. As the distance increases, the shadows get lighter and grayer, while the high lights lose their extreme brightness and also become gray; so that in the extreme distance all lights and shadows merge in one hazy mass. Every picture gives a better effect of depth and distance if it shows this difference in tone values. This is sometimes called aërial perspective, I believe.

Figures may be introduced into a landscape picture, if they are kept entirely subordinate. Otherwise, there is likely to be a division of interest. There should never be any chance for doubt as to whether the picture is a landscape with incidental figures, or a figure study with landscape background.

The foreground should be in sharpest focus. There is no objection to the distance being somewhat out of focus, and therefore lacking in fine definition. Indeed, such a distribution of focus helps to give an effect of depth. But the difference in sharpness of focus between foreground and distance should not be too great.

About Color Values Sky and clouds are not truthfully represented in a photograph by blank white paper. This leads us to a brief consideration of color values and how to photograph them as correctly as possible. Violet or blue is the most active color, photographically. Plates and film are most sensitive to blue, less sensitive to green, and very much less sensitive to yellow. Orange and red have so little effect on the ordinary film that a subdued red light is safely used to illuminate the workroom where film and plates are manufactured, and as an illuminant in photographic darkrooms where they are developed. "Orthochromatic" plates and films are sensitized specially for green and yellow, while "panchromatic" plates are more or less sensitive to all colors, including red.

Color Filters Both orthochromatic and panchromatic plates are so extremely sensitive to blue, however, that for truthful rendering of color values with them it is necessary to employ a ray screen or filter. This is a piece of yellow glass that fits over the lens. Its purpose is to exclude some of the blue rays, allowing the photographically weaker but visually brighter rays of yellow a chance to be more strongly impressed on the film. The use of a ray filter necessitates giving a longer exposure—the deeper yellow the filter is, the greater increase in exposure. A very pale yellow filter may not require more than two or three times the normal exposure, while a filter of a deep orange yellow may make necessary an increase of exposure of twenty times or more.

I once photographed a crimson rambler rose bush on a panchromatic plate, and used the deep red glass from my darkroom lamp for a filter. I gave 200 times the normal exposure, and it was somewhat under-exposed at that. The effect was very striking, the print showing the red blossoms as perfectly white. The same subject photographed on an orthochromatic plate with a deep yellow filter showed the blossoms nearly black in the print.

Exposure ½ second, Eastman film and Ideal filter

Non-Filter Plates

Then there is a sort of orthochromatic plate in which a yellow dye is incorporated with the emulsion in such quantity that this very yellowness of the film acts as a filter, and very good color effects are given with such plates without using any filter or screen at the lens. Representative plates of this kind are the Imperial "Non-Filter," and Ilford "Screened Chromatic," both of English manufacture. The nearest approach in American plates is the Cramer "Slow Iso," which, as its name implies, is a comparatively slow plate; while the foreign plates just mentioned are at least as fast as the more rapid kinds of ordinary plates and films.

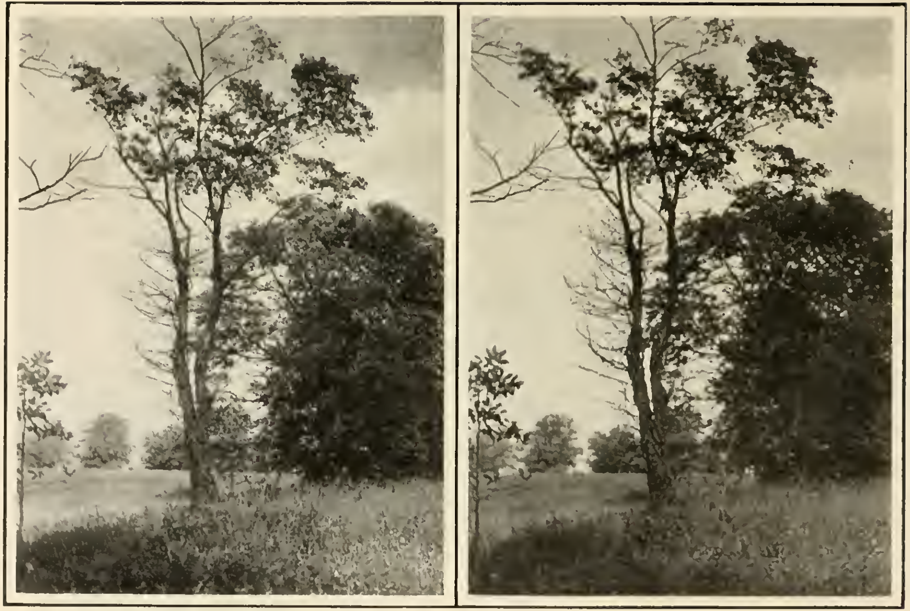
As we said before, all plates and films are abnormally sensitive to blue. The practical effect is that they photograph blue too light, and green and yellow too dark. There is very little difference between the ordinary, or color-blind, plate and the orthochromatic plate in the rendering of color values, when the latter is used without a ray filter. The result in a landscape photograph will be that the grass and foliage will be lighter in tone, and the blue of the sky enough darker so that prominent clouds will show in the print. Nearly the same effect may be obtained by using a light filter with the ordinary color-blind plate, but a much longer exposure will be necessary than with the orthochromatic plate and filter. Thus, the well-known Burke & James "Ideal" filter (now known as one of the series of Ingento filters) makes necessary an exposure increase of at least fifteen times on the ordinary plate, about ten times on film, six or eight times on an orthochromatic plate, and four or five times on a panchromatic plate. The greater the color-sensitiveness of the plate or film, the less increase in exposure will be necessitated by the use of any particular shade of filter. Full color correction can be obtained only by using a panchromatic plate and a deep reddish orange filter. Such a filter is entirely unsuitable to use with a plate or film of less color-sensitiveness.

Exposures with Filters

Roll film and filmpack are sufficiently orthochromatic to give fair cloud effects and rendition of color values generally, when used with a pale yellow filter like the Kodak Ray Screen, necessitating an increase in exposure of about eight or ten times. I have also used very successfully with film the Ideal filter, which is a shade deeper yellow than the Kodak screen. One-half second at *f*/16 is about the right exposure to give on an open landscape in bright sunshine when using Eastman film with either of the two filters mentioned.

Halation

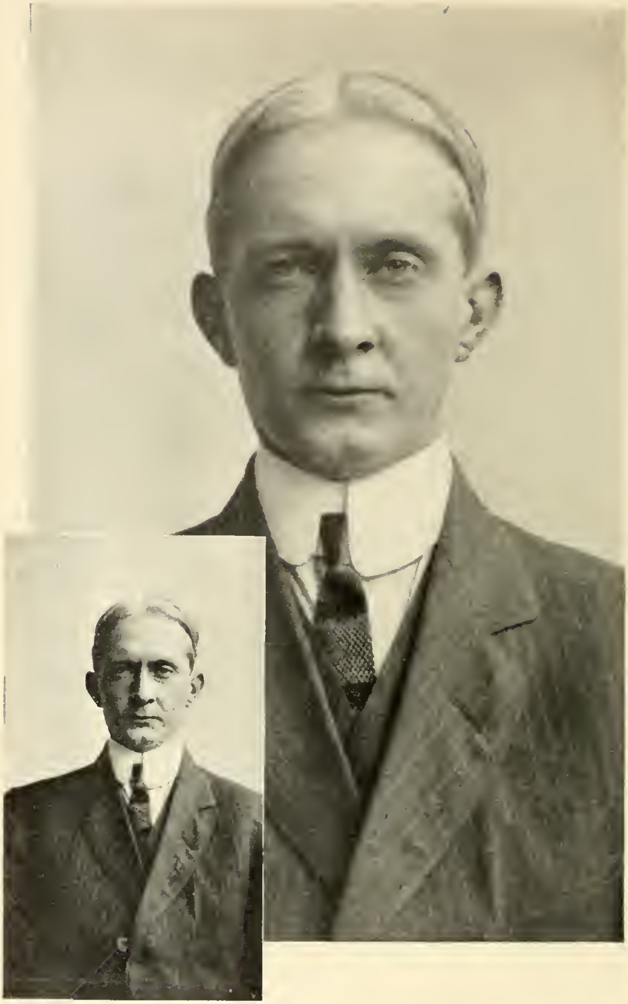
Halation is the spreading of light from a very bright part of the picture,—supposed to be caused in glass plates by the light passing through the plate and reflecting from the back of the plate to the under surface of the film. Halation does not occur to any great extent with film, and may be prevented or greatly reduced in plates by giv-



A. Ordinary plate with Ideal filter *B*. Ortho plate without filter

A color value comparison

Charles F. Rice



Self-portrait. Contact print (at left) from a negative made with No. 2 Brownie. Exposure ½ second, lens $f/16$, portrait attachment. Enlargement on gaslight paper.

Charles F. Rice

ing the back of the plate a black or dark coating that will tend to absorb rays of light rather than to reflect them. Most of the foreign-made plates may be purchased ready "backed." American plate-makers render plates "non-halation" by coating the face of the glass first with a low-speed emulsion, then with the regular fast emulsion. Such plates are called "double-coated," and the idea is that the full details of the picture will be impressed on the fast outer emulsion before the light from bright spots in the image will have time to cause halation by reflecting from the back of the plate to the slow under-coating.

If one plate is to be chosen for all classes of photographic work, the fast double-coated orthochromatic plate is best. Film corresponds very closely to this kind of plate—being rapid, color-sensitive and non-halation.

Speed Subjects

Rapid motion holds a mighty attraction for us humans. Lads find an unfailing source of joy in the "choo-choo cars," and grown-ups, even if they don't care so much about watching the trains go by, are nevertheless attracted by such speedy objects as motor-cars, aëroplanes, etc. Nothing is more natural than to try the new camera on the fastest-moving object that presents itself. One afternoon I went to a race-track where automobile races were being held, and there I saw a boy snapping away at the whizzing cars with a Bull's-eye camera. He was having a fine time! But what kind of pictures do you suppose he got, with his 1-40 second at *f*/16—and the automobiles doing better than a mile a minute? Eighty-eight feet a second is covered by an object moving at the rate of a mile a minute. One-fortieth of eighty-eight feet is a little over two feet. So that the speeding auto would move over two feet while the boy with his Bulls-Eye was giving an exposure of 1-40 second. His pictures were an indistinguishable blur, no doubt. Yet, he might have secured a fair result, even with so fast-moving an object, if he had taken the picture when the auto was approaching—"almost head-on"—instead of at right angles; and if in addition, he had swung the camera around, following the motion of the car so as to keep it as nearly stationary as possible in the finder, the background would have been somewhat blurred it is true, but the car itself would have shown less sign of movement. I have in this way successfully caught fast freight trains with a No. 2 Brownie. Very rapidly moving objects are given a more truthful representation, photographically, if there *is* a slight blur.

Children at play, baseball players or athletes in action, can be successfully photographed with slow-shutter speed, and at the same time the result will look more true to life, if the exposure can be made at an instant of arrested motion; as, for instance, when the pitcher has his arm drawn back for the throw, or when the pole-vaulter is just clearing the bar at its highest.

Street Views

Street views are better taken with the camera pointed nearly in the direction in which the street extends, rather than across it. This is so because the lines of the buildings give a more pleasing perspective looking along the length of the street, and even ordinary street traffic will move too fast for the slow shutter when photographed at right angles to the direction of movement. A viewpoint somewhat above the sidewalk level is preferable, although it is not always easy to find such a favorable position. The camera must be held level, or the buildings will be pictured as leaning from the perpendicular. If you would catch little incidental street happenings, like the blind beggar receiving a donation, or the beautiful lady alighting from a Fifth Avenue stage, you must make a practice of sauntering along the street with your camera in full readiness for the exposure—otherwise the incident will be all over before you are ready to make the exposure.

Beach Pictures

Beach scenes are apt to be vastly uninteresting when they show a broad expanse of sand and water, with the bathers making little spots here and there all over the picture. In looking at such a photograph, the eye is at a loss to find any object of particular interest, and the result is not satisfying. It is better to have a figure or small group in the immediate foreground and let the general view of beach and breakers form the background. But the people in the foreground should not seem, at any rate, to be conscious of the camera; and, to catch them actually unawares, a little camera is better than a big one because it attracts less attention. I remember, one day last summer, at the beach there was a man using a ponderous reflecting camera, and wherever he went all eyes turned in his direction. At the same time I was busy with a little vest-pocket camera, and nobody noticed what I was doing. Beach pictures are generally more pleasing if taken looking along the length of the beach, rather than straight out over the water at right angles to the horizon.

Finding Pictures

Realistic scenes from everyday life, both indoors and out, are naturally interesting to those who know the persons and places pictured; and if care is taken in their selection and arrangement, views of that nature carry a universal appeal. I have in mind such subjects as Grandma with her knitting, Mother making pies, little Brother and Sister in their varied activities, the old umbrella-man or the itinerant clock-repairer—all at work or at play. That such subjects show familiar actions is probably the cause for their making such charming pictures. Simple apparatus is quite capable for work of this kind, if we will confine ourselves to such subjects as come within our exposure limits. The Brownie snap is adequate for children at play outdoors in the sunshine, and the indoor pictures may also be successfully accomplished with such a camera—always giving full exposure. Ten seconds or more may not be too much, but it is easier for the subject if he is engaged in some familiar task to hold a position that length of time without looking stiff or "posed," than it would be in the case of the formal "look pleasant" attitude of the conventional portrait.

Buildings

Views of buildings, or parts of buildings, interior and exterior, come under the general classification of "architectural photography." Most work of this kind is beyond the capabilities of the fixed-focus box-form camera, unless it be a picture of a single room or a corner of that room. The single lens is not suitable because at the edge of the picture such a lens renders straight lines curved. Folding Pocket Kodaks or cameras of that class, with a rectilinear lens, are capable of accurate and pleasing architectural views. Their field of usefulness in this work is increased if a wide-angle lens can be substituted for the one regularly used. Failing that, the angle of view included by the regular lens may be somewhat widened by the use of the portrait attachment previously mentioned under the directions for portraiture. The portrait attachment shortens the focus of the lens, and if it is to be used with a focusing scale (as it would have to be with roll-film) a new scale will have to be supplied, or marks made on the camera-bed showing how far the front should be extended to bring objects in focus at different distances, by focusing on a ground-glass when there is no film in the camera.

In order to make true and accurate photographs of buildings, the camera must be absolutely level. Otherwise the perpendicular lines of the building or room will be leaning in the picture. It is desirable to take all pictures from that level at which the eye is accustomed to see the view, so that the perspective will appear natural in the photograph. Thus, an exterior view of a building is best taken with the camera five or six feet above the ground, while an interior may be taken with the camera not higher from the floor than the level of a person's eyes, when sitting in a chair. If, in either case, the lens does not include enough in height or depth, the camera should not be inclined to gain the desired angle, but the lens must be raised or lowered by means of the rising and falling front.

I have previously mentioned the fact that a building presents a more pleasing appearance when viewed in a corner-wise direction, rather than squarely in front. This rule does not always apply to detail views, as an arch or arched doorway, for instance, which is apt to look distorted if taken from the side.

Interior Exposures

Correct exposure is a very troublesome problem in making photographs of interiors. The time may range from a few seconds to as many hours, and the only really safe way is to use an exposure-meter of some sort. In testing the light with a meter, the rule for interiors is to expose the paper at the darkest part of the view where full detail is required, with the face of the paper toward the light falling on that spot. If it takes too long for the paper to darken to the standard tint, the time it requires to darken to the least visible tint may be calculated as one-sixteenth the full time.

Windows

Windows will sometimes come within the field of view in making an interior. Indeed, it is not always possible, nor even desirable, to avoid showing windows in the picture. The only objection to them is that they are so bright in contrast to the rest of the room that there is danger of halation. If plates are used for interior work, they should therefore be backed or double-coated. Film has good non-halation properties. If a room can be photographed so that the main illumination comes from a window outside the field of view, the shades may be drawn at those windows that are included. After the full exposure has been made, the shades may be raised and a second very brief exposure given. Taken in this way, the window is not shown as a patch of blank white; but detail is preserved in the curtains or hangings, if these are present, and, if the supplementary exposure has been accurately timed, the photograph will show outdoor details seen through the window.

Focus should be sharp on all parts of an interior view—both near and distant. Set the focus for a distance a little nearer the camera than that point which is half-way between the nearest and farthest objects included, and use a sufficiently small lens opening to make everything sharp.

Flashlight Pictures

Flashlight is used for illumination where daylight is not available, for almost every kind of photographic picture-making. It may be used in the form of magnesium ribbon or flash sheets, both of which burn with comparative slowness; or in an explosive compound powder, used in cartridges or in open flash-lamps. Blow-lamps use pure magnesium in the form of a powder. I have used the flash in sheets, in cartridges and in lamps; for portraits, groups and interiors. Some photographers have been able to use flashlight for portraits with great success. For methods and particulars, I refer the reader to "Flashlight Portraiture" in the Big Six Series.

Doing the Rest Yourself "You press the button, we do the rest!" That famous phrase was used in Kodak advertising years ago; and in compliance the amateur mailed his exposed films to Rochester, there to be developed and printed from. The developing and printing done by the Eastman Company was first-class; indeed, they couldn't afford to turn out any other kind. In more recent times there has arisen an army of "finishers" all over the country, who "do the rest" for the amateur. Some of their work is good, some bad, some indifferent. Dare I say that a great deal of it is indifferently bad? I think so. I have had some of my exposures developed and printed by the "finisher," and well done, too. Also I have spoiled many exposures by my own blunders in after-treatment. But I long ago decided that, if there was any spoiling to be done on my pictures, I would prefer to do it myself. It is by such blunders and spoiling of good material that we learn. And I would make an earnest plea to every amateur photographer to do his own developing and printing—even though such procedure may not seem quite so *simple*. He will not get so good results, at first, as if he trusted the work to someone more experienced. But he will learn the why and wherefore of photography much more quickly and surely than the one who leaves "the rest" to others. There is satisfaction in the thought that the finished photograph is all the work of your own hands—from the exposure of the film to the mounting of the print. Besides, it's lots of fun to do it all oneself.

Tank Development The developing-tank is one of the products of "Simplified Photography." I have used the film-developing machine (which was the predecessor of the tank), the roll-film tank, the filmpack tank, and two different styles of plate tanks; and I am prepared to maintain that tank development is in many ways simpler and surer than development in the tray. It eliminates the darkroom altogether, as far as roll film is concerned, and one need only dodge into a cupboard for a minute to load the tank with filmpack or plates. This is no place for detailed instructions on manipulation of the tank. Such instructions are supplied with the tank.

The tank has emphasized the teaching that it is futile to attempt to remedy mistakes in exposure by juggling the development. In one tankful of exposures there may be some under, some over, and some correctly exposed. The strength of developer and time of development are regulated with regard to the correct exposure. All get the same treatment in the tank, and the under and over exposures may be "doctored" afterward, if they need it. Short development will tend to thin negatives with little contrast, while the tendency of prolonged development is toward dense negatives of much contrast. The plate or film exposed on a flatly lighted subject, such as a wide expanse of open country, will require longer development to produce normal contrast than the plate or film that has been exposed on such a naturally contrasty subject, for instance, as the view of a room with dark corners but some parts brightly illumined by direct light from a window—though both exposures may be correct. The only way to do, if they both go into the tank together, is to strike an average time of development that will not be too much for the interior. It is a practical impossibility to produce negatives of uniform contrast from subjects whose contrasts differ greatly; but that is not necessary, for different grades of photographic printing-paper give such widely varying degrees of contrast that they will take care of a very great difference in the negative.

Pyro powders make an excellent tank developer. It is much simpler for the amateur to use the ready-prepared powders than to buy the chemicals in bulk and do his own compounding. Rodinal (or citol) is a concentrated liquid developer that only has to be diluted with water to be ready for use, and is thus even more convenient than the powders. It is also excellent for the tank. It works clear and soft, and is a good hot-weather developer because no alkali is used with it. I believe it is good advice to get accustomed to one developer, and stick to it. There is no magic in an any particular developer. They are all good.

Making Prints

Gaslight paper is the most popular printing medium for amateurs—and professionals too. The materials that are best for the professional are best also for the amateur, and vice versa, though the principle is not universally recognized. Gaslight paper was originally used almost exclusively by amateurs, and it was a long time before professionals came to realize its virtues. Then they began to use it on the quiet. Now there are various grades of gaslight paper made particularly for professional use—Artura, Professional Cyko, Haloid, Platora—these are a few. And they are just as good for amateurs as they are for professionals. Velox, Cyko, Argo, and a host of others I need not mention, are intended especially to meet amateur requirements.

Gaslight Papers

As its name implies, gaslight paper may be printed by artificial light. That fact, and its capability in various grades to accommodate negatives of extreme difference in contrast, account for the popularity of gaslight paper as a printing medium. You can read all about it in THE PHOTO-MINIATURE, No. 93.

Most makes of gaslight paper come in three grades of contrast—hard, medium and soft. "Hard" paper is for use with soft negatives: "medium" paper for medium negatives; and "soft" paper for hard negatives. The so-called professional papers are soft, and most of them are slow-printing. In order to get the best possible print from every negative, it is necessary to have on hand paper of all three grades of contrast. You may get negatives demanding the three grades of paper from one roll of film—all exposures having been correct, but the subjects themselves being of different contrast. Then, too, with any subject, the longer a film or plate is developed the more contrasty it becomes. Thus, in the tank, with an average subject, a ten-minute development might give a soft, thin negative that should be printed on hard paper; a twenty-minute development would give a negative of more vigorous contrasts, suitable for medium paper; and the negative that received a thirty-minute development would be denser and harder still, and should be printed on soft paper.

Developers for Prints

Makers of gaslight paper put up developer in powder form in tubes, that is as good as any to use. If the amateur makes many prints, however, it will be more economical for him to invest in a pair of good photographic scales, buy the chemicals in bulk and mix them himself, according to the paper-maker's directions. And, if he is of an experimental turn of mind, there will be considerable joy for him in varying the proportions of the ingredients, and seeing what will happen! I have done this with metol-hydrokinone—working sometimes with metol only, no hydrokinone, and that gives a developer that makes very soft prints; then again, cutting down the metol and increasing the hydrokinone results in more contrasty prints. Contrast is also varied by the extent to which the developer is diluted, and the amount of bromide of potash used affects the color or tone of the prints. The minimum of bromide gives a blue-black tone, and, as more bromide is added, the tone changes to pure black, then to olive and brown shades.

Sepia tones may be obtained on gaslight paper with the sulphide re-developer, which is most conveniently obtained ready-prepared in tubes; or by the hypo-alum bath. The paper-makers recommend hypo-alum to the professional; and, as I said before, what is good for the professional in the way of materials is good for the amateur. An excellent hypo-alum formula is the following, taken from the professional Cyko Pointer: Water, 32 ounces; hypo, 4 ounces; boil and then add powdered alum, 1 ounce; stir well while adding, and when cold add a solution prepared as follows: Silver nitrate, 20 grains; salt, 20 grains; water, 1 ounce. The one-ounce solution of silver nitrate and salt will not dissolve clear, and the whole gallon bath of hypo-alum, after the addition of the nitrate-salt solution will be turbid and milky. Don't be alarmed at its appearance, however; that is as it should be. Used cold, this bath takes about twenty-four hours to tone the prints. Used about as hot as can be comfortably borne by the hands, it will tone in from thirty minutes to an hour or more. The prints, after toning, should be thoroughly washed, as they are after fixing.

Other Papers Negatives that are sufficiently contrasty to make good prints on soft gaslight paper are suitable for either of two other kinds of printing-paper that I would call to the amateur's attention—self-toning paper and platinum. Both of these papers are more simple to use than gaslight paper, their only drawback being that they need sunlight, or at least daylight, for printing.

Reducing Negatives Too prolonged development may result in a negative that is so hard and contrasty that it will not give a decent print on any kind of paper. Its density and contrast may be modified by treatment with what is called a reducer. I advise the amateur to buy the ready-made reducer in powder form, rather than attempt to mix it himself. You get the same results with less bother.

Intensifying Thin negatives are caused by under-development or under-exposure, or both. The negative that is fully exposed but under-developed will show details in both highlights and shadows, but all parts of the image will be weak. If the thinness is the result of under-exposure, there will be little or no detail in those parts of the negative which represent the dark parts of the view. An over-developed under-exposure will have very weak shadows, while the highlights of the subject will be very dense and black on the film. Such a negative is practically hopeless. But negatives whose highlight portions are so thin, whether from under-exposure or under-development, that they will not make a strong print on hard gaslight paper, may be improved by treatment in an intensifier—which should be used in weak or artificial light. Again I would advise the purchase of the chemical in ready-prepared powders. If the amateur, however, prefers to mix his own intensifier and reducers, very good formulas can be found in THE PHOTO-MINIATURE, No. 116, pages 367 to 371.

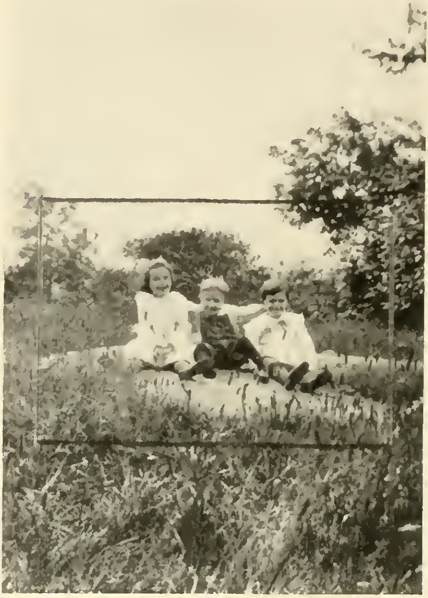
Under-Exposure Amateurs whose cameras have a single lens working at *f*/16 are continually in danger of under-exposure in making "snaps." I hinted at this in my reference to the exposure-meter, when it indicated ⅕ second as the right time, on a bright November day, and 1-40 second was the slowest instantaneous speed provided by the shutter. Even at that, some sort of result may frequently be obtained by intensifying the thin negative that is bound to be got by normal development of an under-exposure. Don't attempt to force up an under-exposure by prolonging the development. Unless it is a very flatly lighted subject, it is much better to give it normal development and get printing density afterward by intensifying. Inexpensive cameras are now being made with shutters that provide for a slow snap of about 1-15 second. This is emphatically a step in the right direction, which should have been taken long ago. It will do away with much of the disappointment experienced by beginners when they continually get poor pictures from under-exposure without fully understanding just what is the trouble.

Latitude in Films

Plates and films have considerable latitude in exposure—which means that if one second is the right exposure to give, a good picture will probably be obtained by any exposure between ¼ second and 4 seconds. As a rule, over-exposure is better than under-exposure. I once made a series of six exposures on the same subject, which was one involving a considerable range of light intensities, calculating the exposure with a meter, and gave exposures ranging from ⅛ to 4 times the indicated time. I developed them all in the tank together for the same length of time, and all except the ⅛ gave printable negatives. There wasn't much to choose between the ½, 1 and 2. Under-exposure favors the light parts of a view, while over-exposure favors the dark parts. The correct exposure to give a subject including a long range of lights and shadows is necessarily a compromise between the extremes.

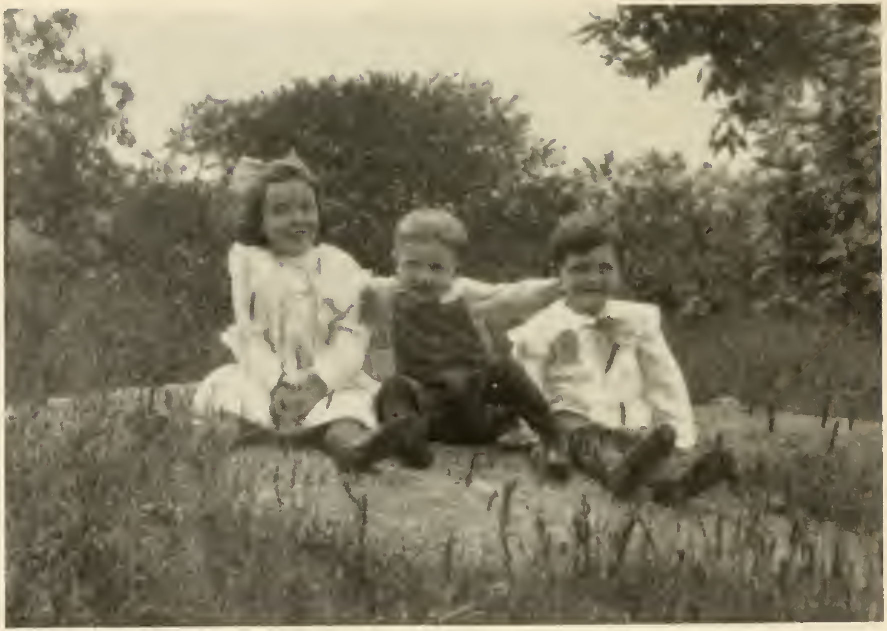
Enlarging

The Brownie enlarging-box, or camera, is simple, cheap, and efficient. It is a collapsible, cone-shaped box, one end of which is adapted to receive the negative. At the other end of the box is placed the sensitized paper on which the enlargement is to be made. Inside the box, fixed at the right place, is the lens. Negative and paper being placed in position, the whole apparatus is taken outdoors, or tilted up at the window, so that unobstructed light from the sky may pass through the negative and lens and impress the enlarged image on the paper. I am limiting myself to processes and apparatus



See enlargement on page facing

that are simple—lest we forget, our subject is "Simplified Photography"—or I might go on at length to describe various other means of photographic enlarging. The amateur could use his own camera, of course, backed up to the window, all light being shut out except that which would come through the camera, and the paper being attached to a perpendicular support at the right distance from the lens. Then there are artificial-



Enlarged from the portion marked on the small print on opposite page, made with a No. 2 Brownie

Charles F. Rice

5·69.

The Babies' Day

Charles F. Rice

light enlargers of great variety. For the price of one of these we could buy a half-dozen or more Brownie enlargers, and set them out to print all at once—as the professional does with his printing-frames. Whatever form of enlarging apparatus the amateur finally acquires, I think he will do well to start with some such fixed-focus enlarger as the Brownie box; for, as I said before, it is simple, cheap and efficient.

Bromide paper is about ten or twelve times as rapid as gaslight paper, and that is the reason, no doubt, why bromide is still more generally used for enlarging, especially by professionals, whose time is money. But the quality of an enlargement on gaslight paper is far-and away superior to bromide, and that fact is beginning to be realized by commercial workers. Besides, gaslight paper is simpler to work with, requiring no darkroom and being easier to handle in development. I strongly recommend gaslight paper for enlarging. Several good methods and apparatus are described in THE PHOTO-MINIATURE, No. 123.

Photography in Winter

Photographic activity need not be suspended in the winter. If there is snow and ice, the camera may be kept busy with outdoor subjects—both snow-clad landscapes and coasting and skating scenes. Remember while winter sunlight is weak, the snow reflects it so strongly that very short exposures are possible when snow is on the ground. Dark, high-ceilinged rooms or church interiors may be photographed most successfully when the snow outdoors reflects light through the windows up into the dark corners. Sun-lit snowscapes call for a ray-filter, to be truthfully rendered.

Long winter evenings may be profitably employed in printing on gaslight paper from the summer's negatives, and making up the prints into albums. Then is the time, also, to look over your negatives and index them, and sort out those that need intensification or reduction. If you have a magic lantern or any sort of projecting apparatus, there is opportunity for much gratification—to others as well as yourself—in making lantern-slides and throwing the pictures on the screen. Lantern-slides are very easy to make.

Hints Take one or two good photographic magazines. Read them conscientiously, advertisements and all—yes, *particularly* the advertisements. Send for all free reading matter, catalogs, etc., that the advertisers offer.

Beware of dust and dirt. Keep your camera clean, inside and out; and be especially careful to see that the lens is kept clean. If the lens is dirty, it will not make good pictures.

Don't be afraid to make mistakes. I don't mean *careless* mistakes. You must use your brain—that's what it is for. But for instance, if a picture subject presents itself and you are in doubt about the exposure, don't pass it by. Take a chance, doing the best you know how. It will help you to learn the possibilities and limitations of your camera and materials. I never expect to stop spoiling films and plates and paper until I give up taking pictures. We learn by our mistakes.

Results depend more on "the man behind" the camera than on the camera itself. Fayette J. Clute says, in Camera Craft:

"The worker who has only an inexpensive outfit with which to gratify his taste for photography may envy the individual who can command the more expensive and pretentious outfit, but, if he will only use the care that his restricted opportunities demand, he should secure even more satisfying results than can be accomplished in the face of the ever-present temptation to "snap" things, just because the speed of one's lens and shutter makes so doing possible."

Finally—don't blindly accept all that I say, or that anyone else says, as gospel truth. Look into the why and wherefore of all these wonderful things that are too readily taken for granted. Try experiments for yourself. It will uphold and stimulate your interest in photography.

CHARLES F. RICE

News and Comment

The announcement of the Ansco Company's $5,000 "Loveliest Woman Contest" has awakened remarkable interest among amateurs and professional photographers, and some thousands of enthusiasts are already at work finding and photographing their "Loveliest Woman."

The prizes are well worth striving for. Every one of us believes in his heart that he knows where to find the "Loveliest Woman." The thing to do is to photograph her, again and again if necessary, until her charms are properly set forth in a series of prints, which should be promptly sent and entered for the Ansco Competition. We can imagine few *mitzvas* so pleasurable as the adventure here proposed. Apart from winning the everlasting approval of the fair one herself, the expectation of winning one of the fifty prizes offered, ranging from $500 down to $50 is guerdon sufficient for the labor involved.

The conditions are very simple, and there are practically no restrictions. You can use any camera or any film or any plate or any paper. And an exhibit of the loveliest of the loveliest is to be made at the Exposition at San Francisco, in 1915. What more could the heart of man desire? To set forth the charms of the "Loveliest Woman;" to win a prize worth while by a single photograph; and to have his work placed before the world in an international exposition. Talk to the nearest Ansco dealer about this contest and watch these pages for the next announcement thereof.

Simplified Photography. There is another way of simplified photography, apart from that so interestingly told by Mr. Rice in this number, which is being followed more and more numerously. This other method consists in securing a pocket camera of the fool-proof variety, that is, one absolutely simple and automatic in its movements, equipped with everything which makes for efficiency and convenience, and designed simply to give good negatives without limitations of condition and circumstance. To this vital thing add an automatic developing system, such as the tank method, and an automatic enlarger properly fitted and adjusted to the camera in use. With this equipment and a printing outfit, the would-be photographer can face the picture-making possibilities of every day and all the time with practical certainty of pleasure and satisfaction in the results of his work.

There are many pocket cameras of the sort here described, and there is abundant choice among development systems combining simplicity and certainty, which applies also to enlarging apparatus. Choice among these can best be had by a careful reading of the booklets and announcements of the different manufacturers whose advertisements are seen in this issue.

At first glance, a photographic manufacturing and importing house without a catalogue of its specialties would seem to be at a big disadvantage. But there is one instance at least, where this condition of affairs is unavoidable for reasons which are altogether *pro bono publico*—that of Allison & Hadaway, 235 Fifth Avenue, New York. This enterprising firm has undertaken to be headquarters for many lines of well-known European photographic specialties, and these are so numerous and so constantly changing and being added to that any catalogue would be out of date by the time it was printed and published. In this difficulty, the Allison & Hadaway Company ask our readers to carefully watch the A. & H. advertisements in the pages of THE PHOTO-MINIATURE and other journals for news of their latest introductions. They also ask those interested to send for their various leaflets and handbooks, which will be sent free on request, with information as to the nearest dealer carrying the A. & H. specialties. A mere list of these A. & H. lines would more than fill a page of the P-M. in small print. Hence we suggest that our readers write A. & H. direct and get in touch with their progressive notions, which have for their chief object the helping of the individual worker to get results—every time.

To meet the constantly growing demand for reliable instruction in coloring photographs, we have reprinted THE PHOTO-MINIATURE, No. 44: Coloring Photographs, with revisions and additions covering the new Assur method and crystoleum painting. The methods of oil and water coloring given in this handbook were written from years of practical experience by an expert colorist, and offer the most thorough course of instruction at present availabie on the subject. Price 25 cents. Sold by all dealers.

The annual exhibition of the Cleveland, Ohio, Photographic Society at the Case Library, announced in our last issue, has been postponed from April 13–25 to May 23–30. The change, due to the incoming of a new administration, affords an opportunity for a larger and more representative showing of pictorial work. Amateurs desiring to exhibit should communicate at once with the Secretary of the Society, Room 405, Cuyahoga Bldg, Cleveland. Ohio.

The wonderful line of Tenax Cameras imported by the C. P. Goerz American Optical Co.. 317 East 34th Street, New York, has a new addition in the Vest-Pocket Roll-Film Tenax, which is bound to win great popularity. It gives pictures 1⅝ x 2½ inches, a standard film size, and measures only 1 x 2⅜ x 4¾ inches. Apart from its roll-film convenience, the dainty little camera is fitted with the new Goerz Dogmar F4.5 Anastigmat and Compound Shutter, with speeds up to 1-300 second. This means the top-notch of efficiency with minimum bulk and weight and maximum convenience. Ask your dealer to let you see this remarkable camera.

The long-drawn legal contest between Ansco Company, Binghamton, N. Y., and the Eastman Kodak Company, Rochester, N. Y., as to the validity of the Goodwin Film Patent, has ended at last in a settlement between the parties, by which the Eastman Kodak Company has paid a very substantial sum (estimated at millions of dollars) to the Ansco Company. This settlement followed decisions in favor of the Ansco Company in the U. S. Circuit Court and the U. S. Circuit Court of Appeals, and apparently decides the fact that the roll film now so universally used in photography was first invented by the Rev. Hannibal Goodwin, an Episcopal minister, of Newark, N. J.

A new edition of that popular guide to lenses, "What Lens Shall I Buy?" revised and with the new 1914 prices, has been issued by the Bausch & Lomb Optical Co., 634 St. Paul Street, Rochester, N. Y. Write for it and mention this note. It will add to your working knowledge about the most important factor in photographic work, viz., the proper choice of the right lens for any special class of photography.

Some of the most pleasing colored portraits I have seen in many a day attracted my attention in the showcase of a Fifth Avenue photographer during a recent stroll. On inquiry I was told that they were Photoloid prints colored with Assur colors. For particulars of these two portrait helps, write to the Fiberloid Company, 55 Fifth Avenue, New York, and Schering & Glatz, 150 Maiden Lane, New York.

The new Polygon cameras, imported by the Meyer Camera and Instrument Co., 18 West 27th Street, New York, are fitted with Reitzschel Double Anastigmats and Compound Shutters at unusually reasonable prices. Ask for Catalogue No. 20 and see how the new tariff has brought the last word in picture-making ability within the reach of every amateur.

A noteworthy feast of good things, for the expenditure of 4 cents, is the *Empire Number* of "The Amateur Photographer" (London: Hazell Watson, Viney & Co.). The A. P. excels in its pictorial features, which are as beautiful as they are numerous. Most of the illustrations are reproductions of photographs sent by amateurs in the British Colonies, and show that camera work in Canada, Australia, Africa and India is in no way behind that of the mother country in attractiveness and quality.

The 1914 catalogues are beginning to appear, and great things are in store for the amateur. The new IPSCO catalogue is the first to reach our table, with an attractive color group of Japanese girls on its front cover, which at once sets the mind to speculating as to whether we won't specialize in outdoor color photography this summer. The IPSCO specialties comprise Ica Miniature, Pocket and Hand Cameras and Accessories, Ilford Plates and Papers, and Autochrome Accessories. These are cleverly set forth in text and illustration over 64 pages, and their absorbing interest can be appreciated only by a personal survey of the catalogue. Send for it to the International Photo-Sales Co., 235 Fifth Avenue, New York.

The 1914 Kodak advertising contest is in full swing, and readers of THE PHOTO-MINIATURE who desire to participate should get the bill of particulars from their dealer without delay. The object of this yearly competition is to secure photographs which have advertising value for use in selling Kodak goods. It offers abundant opportunity for pleasure and the cultivation of illustrative skill, which if not successful in this particular contest, can readily be turned into cash in other allied lines. The prizes range from $500 to $25, with a total of $3,000, including two awards of $500. Get down from your bookshelf THE PHOTO-MINIATURE Nos. 63, 120, 124, and you will find therein much information which will help you in these competitions.

The *Colonial and Foreign Number* of the "British Journal of Photography" (London: Henry Greenwood & Co.) is, as usual, a veritable tour de force of photographic journalism. It consists of 32 pages of interesting text matter and over 100 pages of advertising, which are quite as interesting as the text. The price, as always, is 2d, or 4 cents. Now that we have so many British and European photographic specialties in the American market, the pages of the B. J. are as interestingly suggestive and useful to photographers here as there, and readers of THE PHOTO-MINIATURE who would enjoy a review of "what's new in photography" should see this Colonial and Foreign Number.

"Agfa" Toning Colors are the latest introduction of the Berlin Aniline Works, 215 Water Street, New York. They are intended for the toning or coloring of transparencies and lantern-slides. Instructions for their use accompany the materials, but a single trial is sufficient to demonstrate the simplicity of their manipulation and the sureness of results.

"The smallest and lightest vestpocket camera made" is the claim of the Ernemann Photo-Kino Works, 114 Fifth Avenue, New York, for their Ernemann Heag XV. It is a wonderful bit of fine camera construction, in its adjustments and efficiency features, as well as in its compactness. For pictures 1 ¾ x 2 5-16, plates and filmpacks, with an automatic self-raising front. How a camera of this sort, capable of serious work, can be produced and sold for $19.50 is a question which only world-wide sales can answer.

Imperial Plates, Special Sensitive and Non-Filter brands, are now obtainable in pocket-camera sizes. Imperial Plates are the most popular plates in the British market, and this reputation seems to be wholly based on their quality and speed. Send to G. Gennert, New York, for the Imperial Booklets.

Books and Prints

A Treatise on Art. By John Burnet. Containing the Essay on the Education of the Eye; Practical Hints on Composition; and Light and Shade. Clothbound, $2.50. Philadelphia. Frank V. Chambers.

These famous essays were written by Burnet almost a century ago, but their teaching is as vital and as applicable as ever, the principles directly stated in well-considered phrases, and the illustrations cleverly chosen to supplement the text. There have been many reprints, among them the noteworthy reprint in facsimile made by Edward L. Wilson, in 1888, now out of print and unobtainable. The present edition reproduces the text and illustrations of the edition published in 1822, the text being set in new types and the illustrations reproduced in line and halftone. We welcome the reappearance of this familiar classic and hope that it will have the wide popularity it deserves at its reasonable price, which places it within the reach of all students.

The Spell of Switzerland. By Nathan Haskell Dole. 489 pages, with illustrations from photographs and paintings by Woldemar Ritter. Cloth, gilt, $2.50 net. Boston. L. C. Page & Co.

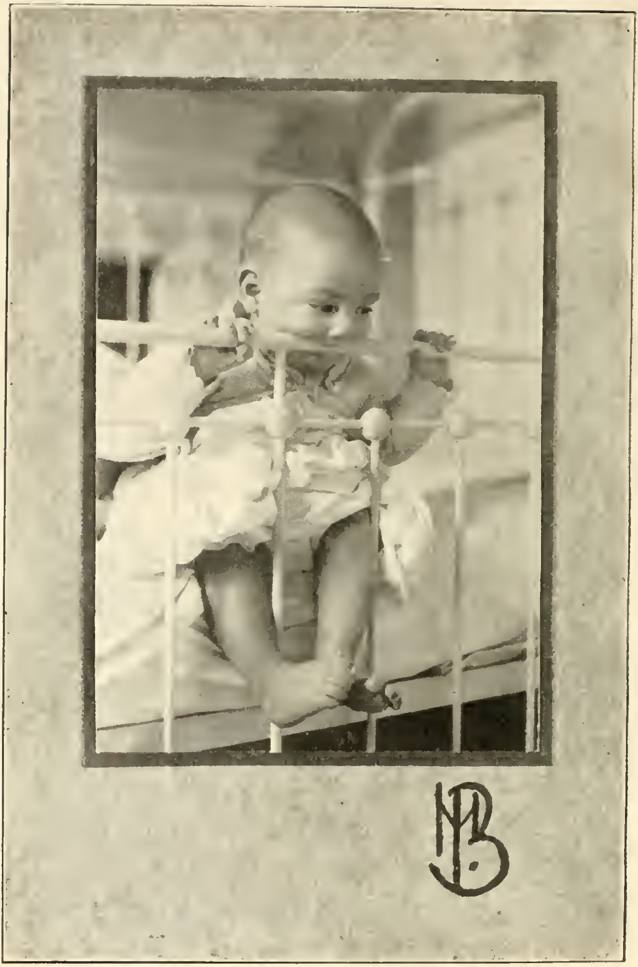
Those who have not visited Switzerland, and would like to know something of its irresistible charm, its wonderful history, its lovely towns and beautiful scenery, will find in this new volume by Mr. Dole an interesting story interestingly told. The author has the rare gift of so telling his story that the people and places dealt with take on life and movement before the eye of the reader as he turns page after page. As a bit of book-making, the volume is a pleasure to handle, light in weight, well printed and handsomely bound. A delightful book for the leisure hour or as a gift for a friend.

Photographic Copyright. By George E. Brown and Alex. Mackie. 89 pages, paper covers. 1/- net. London. Henry Greenwood & Co.

The copyright question is one of steadily growing importance to photographers, despite the deplorable lack of interest shown by American professionals and amateurs. Those who would like to know something of the significance of copyright protection, or of the many legal decisions affecting the photographer's rights in his work, will find in this little book a mine of useful and valuable information on the subject. To be sure, the book concerns itself almost wholly with British copyright law; but there are chapters on American copyright law and the methods of securing international copyrights which, in themselves, are well worth careful reading. The authors, Messrs. Brown and Mackie, are well equipped for the preparation of such a book, and we congratulate them upon a bit of work well done for the helping of photographers.

Practical Cinematography and Its Applications. By Frederick A. Talbot. 262 pages; profusely illustrated; cloth $1 net, postage 10 cents extra. For sale by Tennant and Ward, New York.

In his earlier work on "Moving Pictures" Mr. Talbot told the story of the moving picture and its significance from the viewpoint of the man in the street. The volume here noticed is devoted to the practical and technical side of motion-picture making and projection, and is intended for the guidance of amateurs taking up cinematography for pleasure or profit. It gives the fundamentals of motion-picture production, describes the different sorts of cameras and projection apparatus used, and gives working methods of developing the film, printing the positive, and the operation of projectors. The book is very complete in its information and abundantly illustrated. It should have a large sale at its extremely moderate price.



"The Baby": By Harold M. Bennett

A delightful bit of home portraiture, made with a Kershaw Reflex and Carl-Zeiss Tessar f/4.5. It shows the possibilities of the reflex camera and a modern anastigimat for getting results under difficult conditions.

The Photo-Miniature

A Magazine of Photographic Information

EDITED BY JOHN A. TENNANT

Volume XI JULY, 1914 Number 132

Getting Results with Your Hand-Camera

Until yesterday, a book about the hand-camera and its use would, properly, begin with a brief historical sketch of the evolution of the camera since the far-away days of Niepce. Then it would wander learnedly through many pages about the different types of cameras and lenses in the market, discuss at length the relative merits of plates versus films, give a few hints on exposure and development, and gracefully finish with suggestions on the treatment of various classes of subjects, from babies to snow scenes by moonlight. The amateur of yesterday flourished on such pabulum. But the times are changed, and we with them. Today the amateur artfully dodges history, buys any kind of hand-camera his purse or the fancy of the moment dictates, and asks but one all-comprehensive question: How can I get the pictures I want with this camera?

Perhaps today's amateur is wise in his generation! It matters little, after all, whether he knows about Niepce and his box-camera of 1816. And it matters not at all, at first, whether he can recognize the different types of hand-cameras at sight and call them by name. But it does matter a great deal whether he knows what may be known about his own camera and its possibilities. Few, if any, seek information about a hand-camera until they possess one. And then, to be sure, the thing of vital interest is to know how to get good pictures with that particular camera.

Guides of Yesterday and Today

From this very practical and very direct viewpoint of today's amateur, the books of yesterday about hand-camera work are bound to seem diffuse, and vaguely general in their information. Hand-cameras are so various that any general handbook to their use must necessarily cover more than it discovers. If all hand-cameras were alike in detail and manipulation, and equal in the range of their capacity, one might hope to cover and discover, even in a pocket-book such as this, what the amateur should know in order to use his camera with fair success most of the time. But even the stars do not differ in glory as our modern hand-cameras differ in design, equipment and capacity. There are so many different ways, apparently, of doing the same thing, and every different camera seems to have ways peculiarly its own. Last week I spent a bad quarter of an hour trying to find out how to close a tiny German camera sent me for inspection, without the usual and indispensable chart to its anatomy. And the last pocket-camera I overhauled, fitted with the most expensive of anastigmats, puzzled me with a diaphragm scale such as I had never before seen on a hand-camera, and without rhyme or reason in it so far as I have yet been able to discover. That same camera had so many ingenious, but unexplained, kinks in its makeup that I found something new and novel in it every time I looked it over during the first two weeks. It's a wise amateur who knows his own camera.

Here, then, is a new field of adventure: to make an up-to-the-minute guide for the hand-camera worker of today, so crowded with the essential and vital facts that it will help him to get good pictures with *his* camera, though he may be using any one of the thousand and one varieties listed in the catalogues.

Clearing Away an Old Notion

First, let me clear away the commonly accepted notion that the size, or kind, or cost of the hand-camera controls the quality of the photographs made with it.

There is here a confusion of ideas. These details have to do with the efficiency or range of the capacity of the camera, its ability to give good photographs of different classes of subjects, or under widely varying conditions.

On What Quality Depends

The quality of a photograph depends on (1) the lighting or illumination of the subject, (2) the proper separation or adjustment of the distance between the lens and the sensitive plate or film, generally spoken of as "focusing," so that the film will occupy the focal plane of the lens and thus receive a sharply defined picture image of the subject, and finally, (3) the correct exposure and (4) development of the plate or film. With these assured, you can be sure of a negative which will give good photographs, quite regardless of the size, or kind, or cost of the camera.

The Dollar Camera

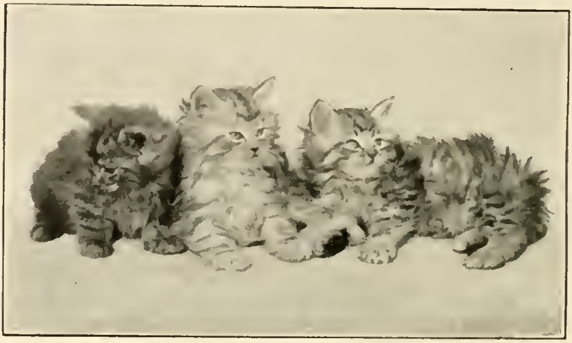
Now, here is the point of this. Within the limits of its capacity, and in the hands of one who knows his camera and its limitations, the little dollar camera of the simplest form will give such negatives just as surely as will the bigger, hundred-dollar camera of the most complex type and capacity.

Why Pay More?

Within the limits of its capacity. There's the rub! That is why so many prefer the more expensive, high-grade hand-cameras. Of course, with some it is the desire for large, direct prints without the trouble or expense of enlarging from the little negatives of the inexpensive camera. Or others may delight in extreme compactness, convenience in carrying and handling, fine materials, construction and finish. But the great big reason is that the high-grade hand-camera gives freedom from limitation as to kind of subject or conditions of working, offers a much wider range of capacity or picture-making ability, and so will give good photographs of subjects which are impossible with the limited range of the inexpensive camera, and will enable one to get pictures when and where the dollar camera is of no use whatever. So, it is not that the more expensive camera gives better pictures than the cheaper one; but that it has a larger efficiency and a wider range of ability.

A Better Investment

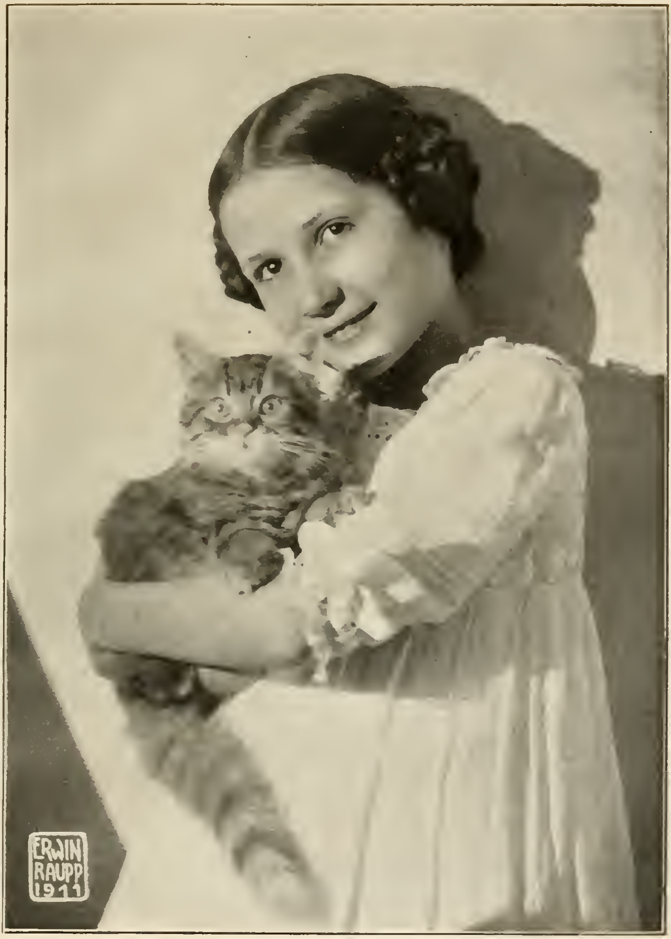
Fortunately, the picture-making ability of the inexpensive hand-camera, selling at one to ten dollars, covers a variety of subjects and conditions sufficient to happily occupy and satisfy a large army of amateurs. But the fascination of photography is so powerful, and the wider range of picture-making ability in the high-grade camera is so alluring, that the latter is well worth its increased cost because of the greater pleasure and satisfaction its use yields. Considering, also, the expense of failure, the high-grade camera is really more economical than the cheaper sort, by reason of the larger certainty of success which its greater efficiency assures. This being so, though the oft-repeated advice to learn photography with a simple, inexpensive box-camera is sound, yet would I urge the reader to get a hand-camera of the better sort, selling at twenty-five dollars and more, as a more profitable investment than the less expensive kind, of limited capacity. It means a bigger percentage of success and fewer failures.



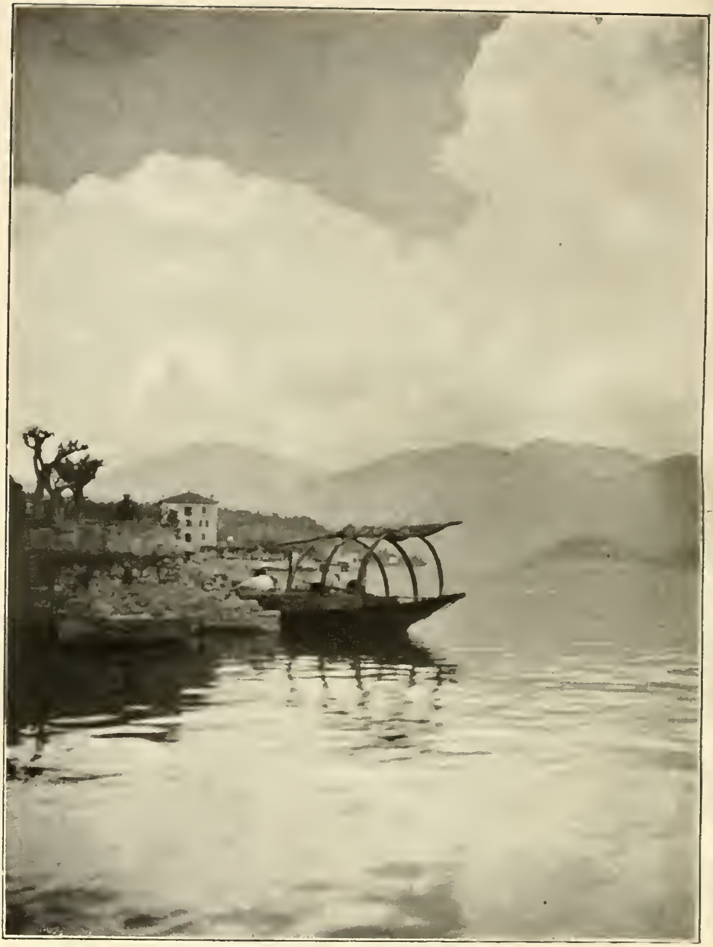
"Pets": By Helena C. Sutherland

Essentials of a Hand-Camera

Whatever the form, or type, or cost, the hand-camera is simply a box or little chamber—rigid or collapsible—which holds a lens at one end (the front), and a device for holding and changing the sensitive plate or film at the other end (the back). It is, of course, so



Home Portrait: By Erwin Raupp
(Made with a Voigtlander Heliar)



Evening Clouds on Lake Como
J. Dudley Johnston
An example of the sort of photograph which repays one for a thousand failures and years of persistent striving

constructed that no light can enter, and so reach the light-sensitive film, except through the lens. Add to this a mechanical device called an exposure shutter, usually fitted near to or in the lens, but sometimes immediately in front of the plate, which uncovers and covers the lens, thus controlling the period of exposure; some means of adjusting the separation of the lens and plate or film (focusing), so that the film will receive a sharply defined picture image of the subject; and a device for seeing that the subject photographed comes or is included within the limits of the plate or film used (the finder), and you have all the essential parts of the hand-camera of today.

Other Useful Devices

There are, however, many other devices attached to hand-cameras, either to simplify, regulate or control the operation of one or other of the essentials already mentioned, or to do other things, which add to the efficiency of the camera, increasing its capacity in this or that direction, or making its use more convenient and more certain. Among these are levels, vertical and lateral front movements, extension beds, automatic focusing locks, devices for calculating the exposure required, or for noting titles or technical data on the film at the time of exposure, and so on without end. Add to these the many ingenious inventions by which, in extremely compact models, almost every part is made collapsible, or reversible, or automatic in placing itself ready for use, and the reader will readily understand why there is so much to learn about the use of our modern high-grade hand-cameras.

On What Your Success Depends

The big fact about hand-camera photography is that your success depends upon your knowledge of and familiarity with your camera, whether its parts or movements be few or many. You must know its range of practical capacity and its limitations; what it can do and what it cannot do. Nine-tenths of the failures (and ninety per cent of the expense) of hand-camera photography result directly from the user's ignorance or disregard of the limitations of his camera. Especially is this true for those who use the inexpensive cameras sold at less than $10. Such cameras will give good pictures of a very wide range of subjects and under trying conditions; but they are necessarily subject to many limitations. If these were known and considered, innumerable failures and disappointments might be avoided. This all-important knowledge can be had from persistent study of the camera itself, thorough drilling in the use of all its many movements and adjustments by the aid of the handbook accompanying it, and a careful reading of the following pages.

''Mud-puddlers'': By Walter Burke

What Lens Capacity Means

The possibility of making a photograph of any subject whatever depends wholly on the ability or capacity of the lens attached to the camera to admit to the sensitive plate or film, during the period of exposure, a sufficient volume of the light reflected from the subject, to impress a developable image of the subject on the film, before there is any movement, either of the camera or in the subject. The light-passing capacity of the lens, therefore, is the measure of the picture-making ability of the camera to which it is attached. The significance of this lies in the fact that, necessarily, all hand-camera exposures must be very short. They are always, in fact, some fraction of a second. Using the hand-camera on a tripod or other support, we can, of course, give as long an exposure as we desire, but this is not what we here understand as hand-camera photography. Working with the camera in the hand, it is hardly possible to hold the camera perfectly still, without tremor or movement, for more than $\frac{1}{10}$ of a second. On the other hand, a great many outdoor subjects include movement, and as any movement (or shifting of position) of the picture image on the sensitive film which exceeds $\frac{1}{100}$ of an inch results in a blurred and unsatisfactory picture, obviously the exposure for such subjects must be within the time in which the image will move $\frac{1}{100}$ of an inch on the film. This period depends, of course, on the rate at which the subject is moving, but will always be less than $\frac{1}{10}$ of a second and may be from $\frac{1}{100}$ to $\frac{1}{1000}$ of a second.

One of the fastest boats on the Lakes
Photograph made with the Eurynar, Series IV

Properties of Lenses

This brings us to a consideration of the lens as the most important feature of the hand-camera, determining, as it does, (1) whether or not we can get a photograph of a given subject and (2) whether we can give this or that kind of subject the exposure required, under the conditions of light, etc., prevailing at the time, to get a good or satisfactory picture.

How They Differ

Lenses differ very widely in power or capacity and, generally, their cost increases with the increase of capacity. This is the principal reason why high-grade hand-cameras are so expensive, being fitted with lenses of maximum efficiency or capacity. It will be sufficient for our purpose here to note that they differ in focal length, in speed or rapidity, in defining power, and in covering power. What do these things mean?

Covering Capacity

The covering power of a lens is simply its ability to project on the plate a circle of light sufficiently large to include the whole of the plate, with even illumination from its center to its corners. If a lens lacks covering power for the plate with which it is used, there will be a visible falling away of illumination from the center to the corners of the negatives made with it.

Defining Capacity

Similarly, the defining power of a lens expresses its ability to give a sharply defined image over the whole of the plate or film, when its largest aperture or stop is employed. Almost any lens will give a crisply defined image if its aperture be sufficiently reduced by the use of a small stop in the lens, but this cuts down its rapidity or speed. Hence the finer the definition given by a lens at its full aperture, the finer the quality of the lens and the more expensive it will be. For example, the single or meniscus lenses attached to inexpensive hand-cameras have very small apertures (openings or "stops"), this being necessary to insure fairly good definition in the pictures made with them. Double or rectilinear lenses are better in this respect than the single lenses—and cost more. Anastigmats are fully corrected to give perfect definition all over the plate they are intended to be used with—and cost still more.

Focal Length

The focal length of a lens is a term used to express the distance between the center of the lens and the plate when a distant object is sharply focused on the latter. It is an important detail, and should be known, because (1) it determines the scale or size in which an object at any given distance from the camera will be reproduced in the picture. The rule here is that of an object at any given distance from the camera, the longer the focal length of the lens, the larger will be the image obtained. Thus if in photographing a sailboat 100 feet away from the end of a dock, with a lens of 4 inches

Another example of the fine work done by the V-P. Kodak. From a post-card enlargement by Miles Greenwood. The original print is shown in the upper right-hand corner

Examples of speed work made with a Graflex, and showing the advantages of a reflex camera and focal plane-shutter for this class of work, where the subject includes rapid movement. (Courtesy of the Folmer & Schwing Co.)

focal length, we get an image of the boat 1 inch high, then a lens of 8 inches focus will give an image of the boat 2 inches high. Of course, the bellows extension capacity of the camera, or the length of the camera body, if it is of the rigid box form, must be sufficient to allow of the separation of lens and plate to give a sharply defined image. As this means increasing the bulk of the camera, generally undesirable, the practical result is that hand-cameras are usually fitted with lenses somewhat short in focal length, *i. e.*, very little longer than the diagonal of the plate which the lens has to be used with and must cover.

Larger Images

To offset this disadvantage, there are hand-cameras with extension beds and bellows of about double the usual extension capacity, which permit the use of lenses of longer focal length than the usual standard. Such hand-cameras are generally fitted with symmetrical lenses, i. e. double lenses made up of two lenses of approximately the same focal length, the combination of the two giving a lens with a focal length about half that of each of the two lenses of which it is composed. With such a lens, and a sufficient bellows-extension capacity in the camera, the worker has a choice of two lenses of different focal length for use wherever this may offer practical advantage. Sometimes the single lenses so forming a combined doublet are of different focal lengths and yet corrected for use separately. In such a case, always presupposing we have the requisite bellows extension, we have a choice of three different focal lengths and, in photographing a subject which cannot be approached nearer than a certain distance, we can thus vary the size of the picture image very considerably. Such lenses are spoken of as "convertible" lenses.

Angle of View

(2) The focal length of the lens in relation to the base-line measure of the plate used with it determines the angle of view, or amount of the subject included in the picture. The longer the focal length of the lens, the narrower is the angle of view on any given base line. For example: a 5-inch lens will include an angle of view of 70° on a 5 x 7 plate, used in the horizontal position,

but if the plate is used in a vertical position, as in figure work or interiors, then the same lens will include a view angle of only 52.° A 3-inch lens used in the same way with the same-sized plate would include view angles of 100° and 80° respectively. Woodman's Table of View Angles may be seen in any year book.

Speed: Rapidity

The light-gathering, or light-passing, capacity of a lens is spoken of as its speed or rapidity and, as we see in the catalogues, the lenses attached to hand-cameras vary enormously as to speed. This speed is measured by the relation between the size of the largest aperture or "stop" and the focal length of the lens which, as we have seen, is roughly the distance between the lens and the plate when a distant object is sharply focused in the image plate, i.e. on the sensitive plate or film. It is a comparatively simple thing to make a lens which will give a sharply defined image in the center of the field (plate) with an aperture or stop relatively small in size compared with the focal length of the lens. Such lenses can be produced very cheaply and are, therefore, found on the least-expensive hand-cameras. But the small aperture means that the capacity of the lens to pass light to the plate is limited, and such lenses are spoken of as slow. To make a lens which will pass a large volume

An Old Mill-house: By F. C. Lambert

of light in a short period of time and, at the same time, give a sharply defined image over the whole of the field (plate) covered, demands special skill and labor. Such lenses are said to work at a relatively large aperture and are expensive. Thus they are fitted only to the more expensive hand-cameras, being, in fact, *the* expensive feature of the high-grade hand-camera. No question but that they are worth their cost.

Nearing the Fold: By Dr. C. G. W. Bull

Diaphragms: Apertures

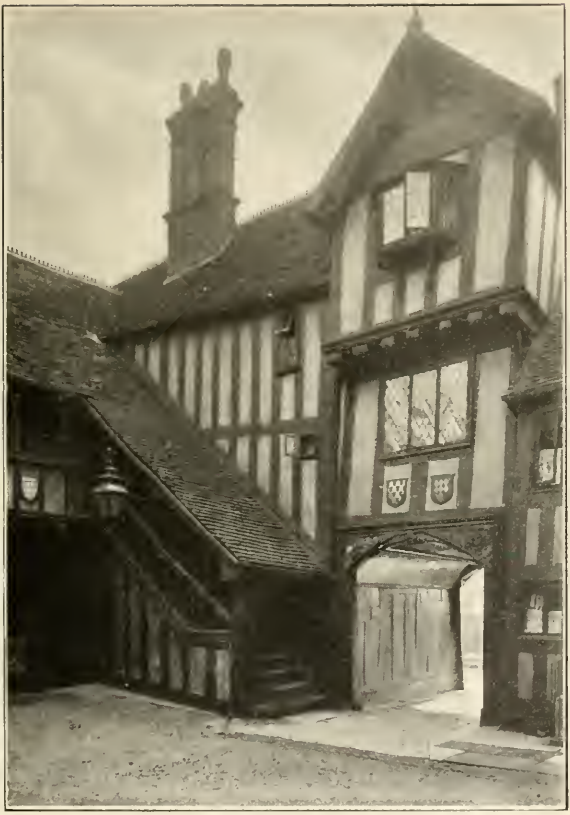
All lenses are fitted with a series of apertures or stops by which the amount of light passing through the lens in a given time may be regulated at will. In all except the simplest and cheapest lenses, this series of apertures is arranged for in a device known as an iris diaphragm (made of thin leaves of rubber or metal overlapping each other), which, when closed, completely covers the lens and prevents any light from entering the camera. By moving a small lever, the leaves open in iris form from the center of the lens, giving a series of apertures of pre-determined size, indicated by numbers on a scale on the lens or shutter, until the largest available aperture is obtained, giving the full light-passing capacity of the lens. Thus the extreme speed or rapidity of a lens is known by the number or figure indicating its largest aperture.

If this is one-fourth the focal length of the lens the figure will be *f*/4 or U. S. No. I.

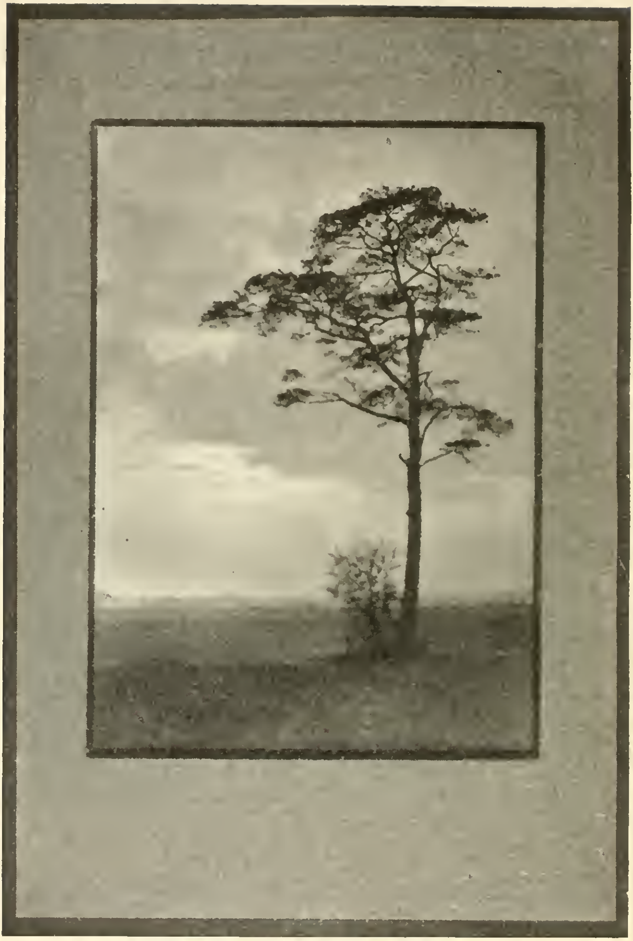
Systems of Numbering

Several different systems are used for the numbering of lens apertures, much confusion arising from the lack of uniformity in this detail. In one of these systems, known as the Uniform System, and applied to all Kodak lenses, the lens apertures are so graded or arranged, from the largest to the smallest, that each succeeding aperture is about half the area of the aperture preceding it, and requires double the exposure which the preceding aperture would require. This system is a material help in calculating exposures as there is a definite and easily remembered relation between the exposure required with any one aperture or stop, and that required with any other in the series. According to this system the apertures are numbered 1, 2, 4, 8, 16, 32, 64, 128. In some Continental systems arbitrary figures are adopted. For such cases the system of the particular lens-maker must be known.

A second system, very widely used and often spoken of as the rational system, numbers the lens apertures by figures representing the relation between the diameter of the aperture and the focal length of the lens. For example: if we have a lens of 4 inches focal length, and the diameter of the largest available aperture is 1 inch, that aperture is known as *f*/4, being one-fourth of the focal length of the lens. Reducing the diameter of the aperture to half an inch we get *f*/8, equaling one-eighth of the focal length of the lens, and so on down to the smallest aperture, *f*/45, which is 1-45th of the focal length of the lens. A disadvantage of this system, which is known as the *f*/ value system, is that it provides no fixed ratio between one aperture and another, simply expressing the light-passing capacity of each aperture by a figure which tells us the relation between the diameter of the aperture and the focal length of the lens. Thus we have apertures numbered by this system as follows: *f*/4, *f*/4.5, *f*/5.6, *f*/6.3, *f*/7.7, *f*/8, *f*/11.3, *f*/16, *f*/22, *f*/32, *f*/45.



Gateway of Leicester Hospital, Warwick
By R. S. Bruce



"Wind-swept": By Ernest Claypole

The late afternoon and the simplest material, as here shown, will often afford pictorial opportunities worth seeking for

Comparisons

By putting these facts about lens apertures in tabular form we get a helpful idea of the comparative speeds or rapidity of lenses numbered by either system, from the practical viewpoint of the exposures required with them.

U.S. Nos.	1		2			4	8	16	32	64	128
F Value Nos.	f/4	f/4.5	f/5.6	f/6.8	f/7.7	f/8	f/11.3	f/16	f/22	f/32	f/45
Expos. Ratio	1		2			4	8	16	32	64	128

This table tells us that, with any given subject and set of conditions, the lens with f/4.5 (U.S. 1¼) as its lagest aperture, will give us the picture image in one-quarter of the time required by a lens with f/8 (U.S. 4) as its largest aperture, and in about one-sixteenth of the time required by a lens whose largest aperture is f/16 (U. S. 16)

Application

Now let us look at the practical application of this in hand-camera work. Suppose we want to photograph a subject when either the light conditions or the movement of the subject requires an exposure of 1-16th second with f/4.5. If we have a high-grade, expensive hand-camera, fitted with a lens working at f/4.5, we can get a good photograph by simply setting the shutter to give 1-16th second exposure. But if the largest available aperture in the lens on our camera is f/8 (U. S. 4), the best we can do in the circumstances is to set the shutter at 1-10th second, and risk getting either an under-exposed negative or one showing movement in the subject during the exposure. If the hand-camera is fitted with a single lens (meniscus achromatic), the largest aperture in which rarely exceeds f/16, then it would be well to leave the subject alone, simply because with that aperture the exposure should be one second to get a good photograph, and that is impossible with the camera held in the hand or because of the rate at which the subject is moving. Fortunately the majority of the subjects photographed by the thousands of amateurs who use inexpensive hand-cameras are secured under such favorable light conditions (e. g. between 10 a. m. and 3 p. m. on bright days from May to September, out-of-doors), that good negatives are possible even with the lenses of such limited speeds as f/11 and f/16 fitted to such cameras. At the same time this explains why the most frequent cause of failure is under exposure, so many subjects being attempted which are beyond the light-passing capacity of the lens on the camera. It will be equally obvious to the reader that, with a lens working at f/4.5 on the hand camera, or even with one working at f/5.6 or f/6.8, one's chances of success with different subjects are enormously increased; and we can photograph at times and under conditions where good pictures would be quite impossible with a lens requiring exposures eight or sixteen times longer than those possible with the rapid lens, which explains, in large part, why the high-grade hand-camera with an f/4.5 lens is worth (what it costs) fifty times as much as the little simple box-camera, with an f/16 lens, sold at a dollar! Reference to standard tables of exposures for different classes of subjects and times of day and year will show, however, that for almost all hand-camera work, except subjects involving rapid movement, speed work generally and abnormal conditions of light, a lens whose largest aperture is f/6.8 will meet all requirements, while f/8

"In June": By George F. Holman

(U. S. 4) is speedy enough for general outdoor work from May to September.

Focusing

Among the difficulties in hand-camera photography, exposure without doubt comes first, and is the direct cause of most of the beginner's failures. The simplest way to overcome this difficulty is to get as thorough a knowledge of the factors governing exposure as is possible, and then to use an exposure meter until the skill and judgment required to work without this valuable aid have been acquired from experience. As we have seen in considering the lens and its apertures, the use of rapid lenses with large apertures is a big help to avoiding the predominant error of under-exposure. But in proportion to the increase in the size of the aperture, there is bound to be greater difficulty in accurately focusing the subject and a loss of "depth of focus" or depth of definition.

Let us see what should be known about focusing the picture image in hand-camera work, and how we can minimize the lack of "depth of focus" inherent to lenses of large aperture.

Depth of Focus

In order to get all we desire of a subject clearly and sharply defined in the negative, it is usually advised to focus sharply on some object in the middle distance of the field and them "stop" the lens down, that is, use a smaller aperture, to get subjects fairly near the camera in focus. But a better way is to know the depth of field capacity of the lens on the camera at different apertures, and apply this knowledge in your work. The term depth of focus (or depth of field or depth of definition) expresses the ability of the lens to give a sharply defined image of both near and distant subjects. Theoretically, a lens can give a sharply defined image only of objects at one point or, as we say, lying in one plane, in front of it. But, practically, we find that the lens will give a more or less sharply defined image of objects somewhat in front of and behind this point or plane of critical focus or definition. The range of this distance is spoken of as the depth of field, or depth of focus, of the lens. This depth of focus depends on the relation between the focal length of the lens and the aperture or stop used with it. Generally speaking, it increases as the focal length of the lens and the size of the aperture decrease. Thus, of two lenses of the same speed, but unequal in focal length, the lens of shorter focal length will give the greater depth of focus. This explains why a 5 x 7 enlargement, made from a pocket-camera negative, with a three-inch lens working at *f*/4.5, will have more depth of definition than a 5 x 7 contact print from a negative made with a hand-camera fitted with a seven-inch lens working at the same speed, viz., *f*/4.5. It also explains why the pocket-camera lens, regardless of the aperture or stop used, gives pictures with greater depth of definition than those made with the larger hand-camera where the same apertures are employed, but with a lens of greater focal length.

Calculating Depth

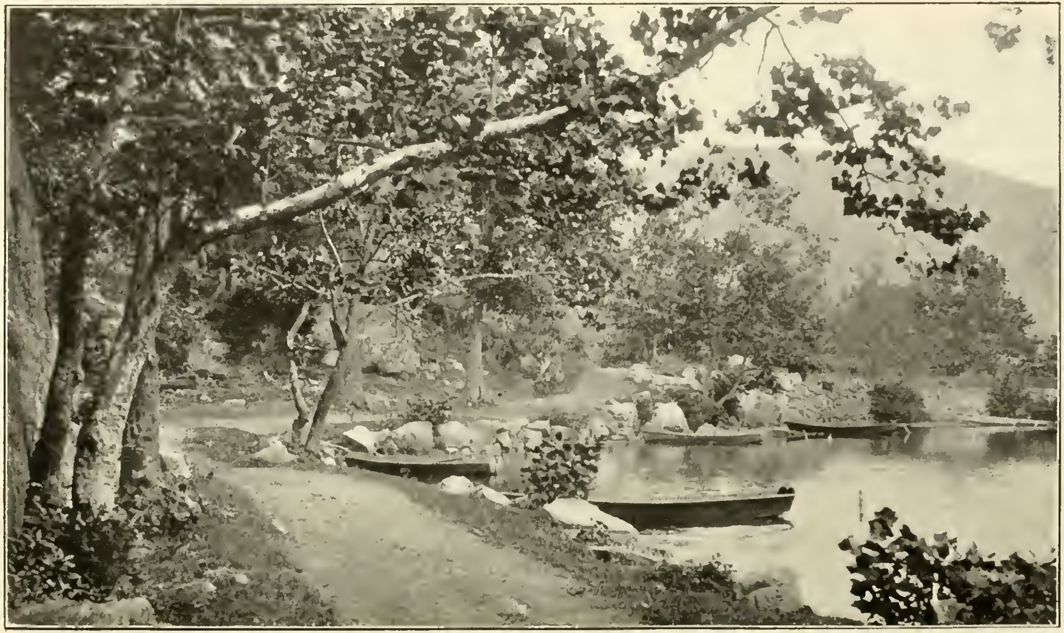
Knowing the focal length of the lens and the *f*/ value of its apertures, as marked on the lens itself or on the shutter, it is a comparatively simple matter to figure out just what amount of "depth of focus" we will get with any lens and any given stop. If the reader will do this for the lens on his hand-camera, the information so gained once for all will serve him as a most valuable aid in getting good photographs.

Hyperfocal Distance

First we need to know the hyperfocal distance of the lens. This means the distance from the camera beyond which all objects will be in fairly sharp focus, and which gives the maximum depth of definition. This distance varies according to the focal length of the lens and the aperture in use—presuming for the moment that 1-100th of an inch is accepted as the standard disc of confusion. It can be found, for any lens and aperture, by the following simple formula: Multiply the focal length of the lens by itself, then by 100, and divide the result by the aperture (*f*) number, and by 12 to bring it to feet. For example: We require the hyperfocal distance of a four-inch lens at *f*/4:

$$\frac{4 \times 4 \times 100}{4 \times 12} = 33 \text{ feet, } 4 \text{ inches.}$$

On Lake Maggiori: By J. Dudley Johnston



A bit of outdoor photography which shows how the reflex type of hand-camera permits one to give attention to composition. By H. W. Hales

The following table gives, at a glance, the hyperfocal distances for lenses of different focal lengths with different stops, calculated on the basis of a disc of confusion of 1-100th of an inch as the standard of sharpness of definition desired in the photograph.

TABLE OF DISTANCES ON WHICH TO FOCUS

with lenses of different length and different lens apertures (stops), so that all objects beyond half that distance will be in focus. Disc of confusion taken as 1-100th of an inch.

Focus of Lens in Inches	Diagram Apertures: F Values and U.S. Numbers							
	F/4 U.S.1	F/5.6 U.S 2	F/6 U.S.2.25	F/7 U.S.3.06	F/8 U S 4	F/11.3 U.S.8	F/16 U.S.16	F/22 U.S.32
	Distances in Feet							
2½	13	10	9	8	7	5	3½	3
3	19	14	13	11	10	7	5	3½
3½	25	18	17	15	13	9	7	4
4	34	24	22	19	17	12	8	6½
4¼	38	27	25	21	19	14	10	7
4½	42	30	28	24	21	15	11	8
4¾	47	34	32	27	24	17	12	9
5	52	36	35	30	26	19	13	10
5½	63	45	43	36	31	23	15	12
6	75	54	50	42	38	27	19	14
6½	88	62	58	50	44	31	22	16
7	101	72	68	57	51	37	25	17

The Formula

Take from this table the hyperfocal distances given for your lens and its apertures. To get the depth of focus figures when the lens is focused on an object at any given distance, proceed as follows, working with the distances given on the focusing scale on your camera. Take any desired distance from the scale and multiply the hyperfocal distance expressed in inches. Now divide the result by the hyperfocal distance *plus* the distance chosen from the scale (in inches), and this will give us the distance away of the nearest object which will be in focus with the stop chosen when we focus on an object at the distance taken from the scale. Again multiply the hyperfocal distance by the scale distance (in inches), and divide the result by the hyperfocal distance *minus* the scale distance, and this will give us the distance away of the farthest object which will be in focus with the stop chosen when we focus on an object at the distance chosen from the scale.

Examples

For example, we are working with a six-inch lens, at *f*/8. The hyperfocal distance for this lens and stop, as the table tells us is 38 feet=456 inches. To find the depth of focus available with this lens and stop at the first distance taken from the focusing scale, viz., 6 feet=72 inches. 456×72=32,832÷528=62 inches=5 ft. 2 in. for the nearest point; similarly 456×72=32,832÷384 inches=7 ft., practically, for the farthest point. Thus, with a lens of 6 inches focus, at *f*/8, focused on an object only 6 feet away, the available depth is practically 2 feet. Focusing on an object 24 feet away, the depth available would be between 15 feet for the nearest object in focus, and 67 feet away for the farthest object, and so on. It should, of course, be remembered that, where the hyperfocal distance for a lens of any focal length and stop is known, then all objects lying beyond half that distance from the camera will be in focus. This fact, in itself, offers a useful distance basis for much hand-camera work, and many expert workers use it advantageously, when occupied in one class of work, e.g., street scenes, by setting the lens at the hyperfocal distance for the stop indicated by the class of subject, time of day and year, etc., and working with that as a fixed focus without the bother of continually changing the focus and stop. For example, in photographing street scenes between 10 A.M. and 2 P. M. on a bright day, with a six-inch lens at *f*/11, set the focus pointer at the 25-feet mark, and keep it there unchanged so long as the light does not alter materially. This will give us sharp definition for all objects more than 13 feet away from the camera, without further trouble or bother.

Fixed-Focus Cameras

All these focusing difficulties, and the consequent risk of failure by incorrect focusing, are avoided by the use of a "fixed-focus" camera. This is simply a camera in which the lens is unalterably fixed in the front of the camera, at such a distance from the plate or film (generally the hyperfocal point for the lens and its largest stop), that all objects beyond a certain distance away from the camera will be given equally sharp in the picture, without any calculation or adjustment by the photographer, other than to be sure that the principal object of the picture lies beyond the focal distance of the lens in use. Such a camera, when loaded with plate or film, is always ready for use. All that must be seen to is (1) that the subject desired falls within the limits of the finder, and (2) that the object is more than the required number of feet away. This "minimum" distance is always given in the instruction book accompanying the camera. As mentioned above, a "focusing camera" can be used as a "fixed-focus" instrument when desired by setting the lens at the hyperfocal distance (on the focusing scale) for any desired aperture or stop.

Within its scope or capacity, the "fixed-focus" camera offers great convenience and usefulness. In the hands of a beginner it gives a larger percentage of good pictures under fair conditions than he could, or usually does, obtain with the more complex "focusing camera." This simply because the "fixed focus" principle leaves no room for individual judgment and possible error.

Focusing Cameras

A "focusing camera" sometimes spoken of as an "adjustable-focus" camera, is one fitted with a device by which the separation of the lens and plate can be altered and adjusted, so that objects lying at different distances from the camera can be sharply focused on the film. This separation is increased for objects near the camera, and decreased for distant objects, and the variation of the distance or separation is less with lenses of short focal length than with those of long focal length. Since the image cannot conveniently be focused on the usual ground-glass focusing screen with hand-cameras (film cameras have no focusing screen), the focusing of the subject with a hand-camera is done by moving the lens backward or forward so that a pointer covers a series of marks on a "focusing scale" fixed near the lens. The marks on this scale are usually numbered with figures representing feet. Thus, when the lens pointer is set to the mark 6, this indicates that objects lying 6 feet away from the camera are in focus, and so on. This method has been extended in usefulness by making the lens pointer automatically lock or fix the lens when pulled out to any desired distance, a device known as the automatic focusing lock provided with all the better sort of focusing cameras.

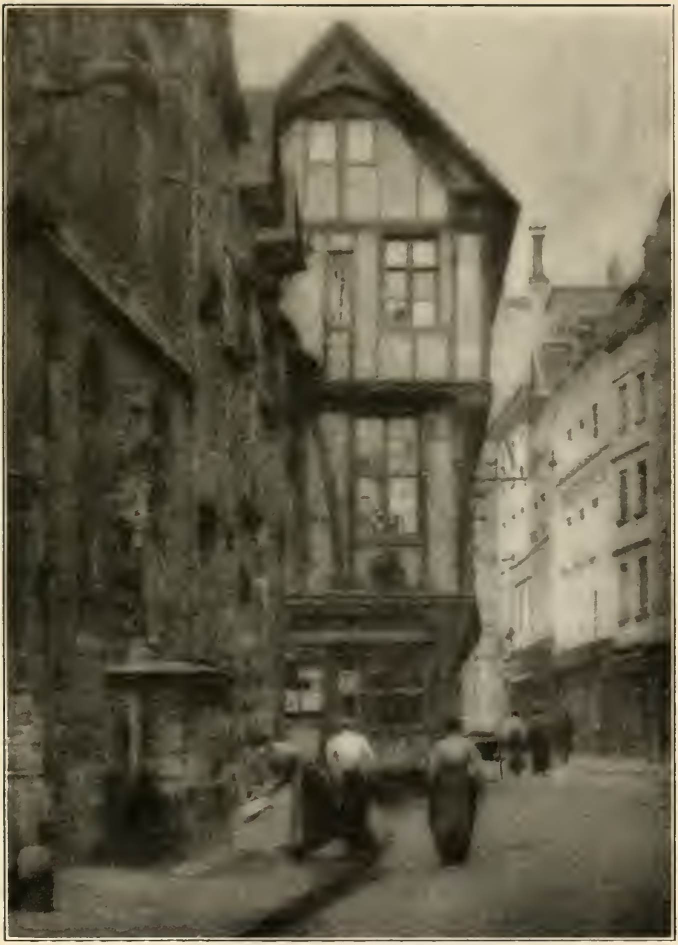
Setting the Focusing Scale

Care simply, not skill or practice, is needed in setting the camera at a given focus. In some instruments, for example the Kodaks, fitted with the focusing lock, there is no call even for care, since the lens front is caused to snap at one point or another, but not in between. But, when the lens is racked continuously along from one mark to another, care must be taken that the pointer (or the tiny bar which crosses the scale) is brought right against the figure denoting the distance of the object. If the pointer or bar is a little above the graduated scale, it is easy to be a little "out" by not looking down from directly above. By looking from a point to the rear, the pointer is seen opposite a number farther along the scale. Makers should (and usually do) put the pointer or index quite close against the scale, so that a mistake of the kind cannot be made.

Clearly, if means can be devised whereby the divisions on the focusing scale are caused to be farther apart, there is less liability to make a mistake, and the camera is more rapidly manipulated. One way of doing this is to attach the pointer to the shaft of the focusing pinion, and set the scale in a circle over which the pointer thus moves like the hand of a clock. But this can be done readily only with a camera having a flat, solid side (box pattern), and few of these even are fitted with a scale of this pattern, for no other reason apparently than that makers aim at the utmost unobtrusiveness and freedom from projections.

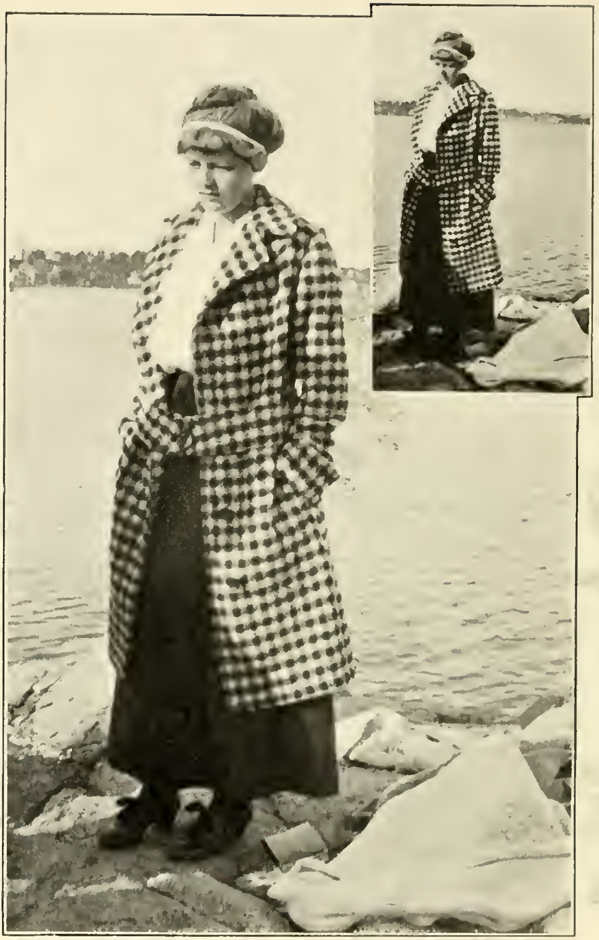
Exposure Shutters

The exposure shutter used in hand-cameras is placed before the lens (as in the cheaper cameras having single lenses), or between the elements of a doublet lens (as in the



In Old Rouen: by Mrs. Mahony

Reproduced to show that pictorial interest and beauty in a photograph does not always mean that everything must be sharply defined—soft diffusion lending a peculiar charm to some subjects.



This pleasing figure portrait shows the excellent lens work of the V-P. Kodak which was used to make the original picture in the upper corner. (From a post-card enlargement by Miles Greenwood).

better grades fitted with rectilinear or anastigmat lenses); or immediately in front of the plate or film (as in the highest type—reflector or focal-plane cameras). The last-named stands first in efficiency, next the between-the-lens or diaphragm form, and last the simple form, which consists of a metal plate pierced with an aperture which is thrown across the lens by means of a lever. The simple shutter gives two exposures: "Instantaneous," i. e., 1-20th second, and "Time." The diaphragm shutter gives (or is said to give) exposures indicated on a speed scale, usually extending from 1-100th or 1-150th second to 1 second, with additional movements for "Time" and "Bulb" exposures. The focal-plane shutter ranges in exposure capacity from 1-1000th of a second to slow automatic speeds of 1-10th to 5 seconds, or it can be opened for focusing or time exposures. This form represents the highest development in shutter construction and has opened the way to possibilities undreamed of in past days.

In the cheaper cameras, the "instantaneous" movement of the shutter is often too quick for the rapidity of the lens, i.e. does not allow sufficient time for the required amount of light to pass through the lens aperture. Save under the most favorable conditions of lighting, this defect often gives rise to under-exposure in hand-camera work. Diaphragm shutters are usually made in the form of an iris diaphragm, opening and closing from and to a central aperture. As a certain fraction of the total exposure is necessarily absorbed in this opening and closing of the shutter, it is claimed that the efficiency (or light-passing power) of such shutters cannot be as great as that possessed by the focal-plane shutter, with which, theoretically, we get all the light passed by the full aperture of the lens, this being clear during the whole period of the exposure. This loss of actual efficiency in diaphragm shutters varies from 40 to 50 per cent in different designs where large lens apertures are used, but is not so great when smaller stops are employed, as in such instances the full working aperture of the lens is wholly free during the largest part of the exposure period. On the other hand, this type of shutter favors the better definition of near and far objects.

What Speeds Are Necessary

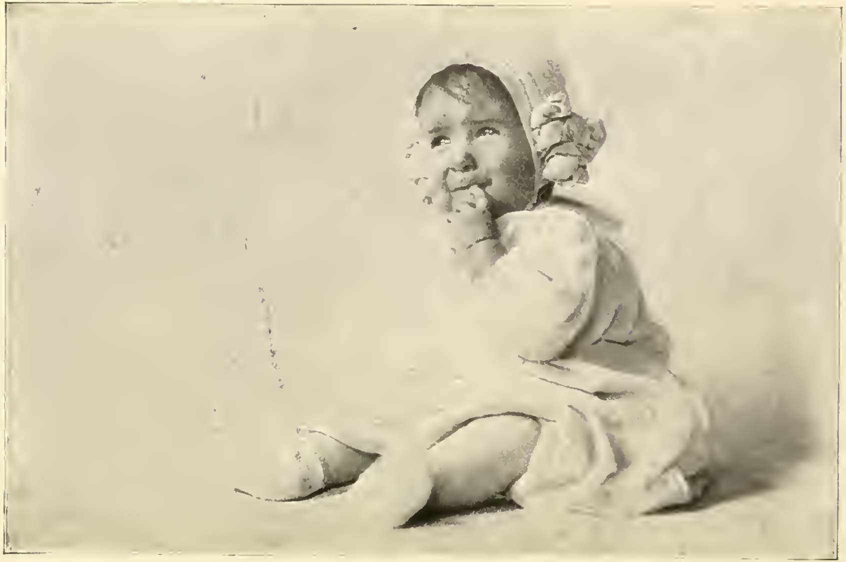
The very cheapest hand-camera gives us one "instantaneous" speed, usually from 1-20 to 1-30 of a second, and, as I have said, amply sufficient for getting sharp pictures of subjects in which there is moderate movement, such as persons walking, and such like. But in hand-camera work we have to consider something else than getting the subject sharp on the plate; we have to look to getting the plate fully exposed, and it will often happen that, with the small stop with which the cheap-camera lens is fitted, 1-30 of a second is too short a time for the full exposure of the plate. We need to be able to give a tenth, which is a time short enough for plenty of subjects (those in which the moving object is a good distance from the camera) as regards sharpness, and long enough to permit a full exposure of the plate, That is why a moderate range of shutter speeds is a valuable means of securing a better average of results. 1-10, 1-20, 1-30, or 1-50,—if my shutter will give me these, I do not grumble. Few of us can hold the camera steady enough to allow of a longer exposure than 1-10, and the top speed of 1-50 of a second in many shutters is really rapid enough for average subjects.

View-finders

At the right-hand side of the lens, often fixed to the upright carrying the lens-board, will be found a little square box with a small lens at the front and a ground-glass lid often shielded with a metal hood. This is the view-finder, commonly accepted as an essential feature of all hand-cameras, but differing considerably in form. It is a miniature camera, and its purpose is to show a reduced but true fac-simile of what will be included in the negative after exposure and development. Whether it does so or not depends upon whether it has been properly adjusted so as to be in agreement with the lens used on the camera. Oftentimes this adjustment is carelessly done, and the worker finds, to his disappointment, that his negative does not show all that he saw on the finder. It is especially important that the finder shall be true when one is photographing subjects with motion, for here we depend upon the finder to tell us the position of the object at the moment of

The Finish

Made with a Sylvar anastigmat, F:6.8. Courtesy of G. Gennert, New York



Child Portraiture: made with a Bausch & Lomb Tessar Ic. Interesting here as showing that softness and modeling in portrait work can be secured with an anastigmat despite the many assertions to the contrary.

(Courtesy of Bausch & Lomb Optical Co.)

exposure. The commonest form of finder is a little square box, with a small double-convex lens fixed in front, a mirror behind, placed at an angle of 45° and a piece of ground glass above. The picture-image is projected upon the mirror horizontally by the lens, and vertically reflected to the ground-glass by the mirror. This form is serviceable, but the image lacks brilliancy. Another form is similar to the above, but replaces the ground-glass with a second reducing lens, which gives a very brilliant picture image and is preferable to the box pattern fitted with ground-glass. Still another is the direct-vision lens-finder, which stands erect on the camera and has to be looked through. This shows the subject more clearly than the finder last mentioned, but requires that the exposure be made from the level of the eye at the time of "finding," which is not always convenient or possible. Another direct-vision finder much favored is a simple wire frame identical in size with the plate or film used. This is fixed vertically above the lens and the subject is viewed by setting one eye to an aperture in a small opaque screen set vertically over the plate. The amount of the subject so seen to be included within the limits of the wire frame over the lens will be included in the negative.

Holding the Camera

The finest lens and the most careful focusing will be all unavailing to secure a good photograph unless we have learned how to hold the camera steady while making the exposure, and proficiency in this respect is the more necessary the slower the speed of the shutter and the lighter the camera. As full exposure of the plate means a shutter speed of 1-20th to 1-40th second, and as the general preference is for a light folding camera, it is necessary to give attention to this point.

First, it is desirable, where possible, to hold the camera firmly against some support. If a post, fence, tree or angle of wall can be found, all the better. If one is not near such aids, then the body is used. Just where the camera ought to be pressed against one's person depends on the subject. If very near, and rather low down, e. g., a figure or animal, the camera ought to be held level and low down, not pointed downward. For this purpose, one knee may be placed on the ground and the other caused to form a supporting table. For average subjects, the waist level is most convenient, and here, with a bulky or heavy camera, a great aid is to sling the camera by a light strap going round the neck, and to keep it steady by a slight downward pressure. Pressure of the camera against the chest is, again, a good position, whilst a very firm support is secured by pressure against the chin or lips. Bear in mind that one can overdo the pressure business; pressure can be maintained so tightly that it becomes almost convulsive, and defeats its very object. Just press the camera firmly, but with some elasticity, and make a habit of holding the breath for the instant of exposure. All the better, too, if this instant comes when the lungs are deflated.

Judging Distances

Next to holding the camera steady, the important thing to learn is to judge how far the subject proper is from the camera. In doing this, a little system will help one to become proficient much more quickly than if one simply aims at "dropping into it." The best way is to practise with set purpose the judgment of the distances which are of most frequent use in hand-camera work. These are: 36 feet (for general views where the principal part of the subject is about this distance, and no object is very near); 25 feet (useful for vehicles, animal studies, etc.); 18 feet (for single figures and small groups); 12 feet (for figure studies on a larger scale, or similar near subjects). This is a fair range, and corresponds with the marking of most focusing scales.

Now to set about practising the judgment of, say, the 12-, 25- and 36-feet distances. The 36-feet distance is easier, and, as depth is greater, in this case there is less need to be exact. Never mind whether you have your camera with you or not; while on a walk or on the way to business, pace off from some object, say, at 25 feet. Take a look back and endeavor to size up the distance in your mind. Repeat the process a few times in different places, and then (still with the same distance) try your skill by stopping at a point which you guess to be 20 or 25 feet from some object, and then pacing out to the object, to see how near you can judge. In this way, stick for a few days to your 25-feet distance, until you can be sure of it, then practice the 18 and 12 feet distances in the same manner.

With this we have covered the vital points in the use of the hand-camera. It remains for the reader himself to familiarize himself with the significance of what has been said on each point as applied to his own camera. A little thinking over each point, and re-reading here and there, with the camera in hand for occasional drill, will give this familiarity. Every vital point understood and applied to your own camera means (1) a big step toward successful results in practice, and (2) the sure elimination of the percentage of waste by failure, which makes photography an expense and a disappointment instead of the most enjoyable of hobbies.

When the technical points of camera manipulation are thoroughly known and understood, then the big problem of exposure awaits you. You can solve this, most of the time, by the constant use of an exposure meter. But this is drudgery, bothersome and inconvenient, from which you can win your freedom only by being familiar with the factors governing exposure with different classes of subjects, and under different conditions. These things are all carefully considered and set forth in detail, interestingly too, in THE PHOTO-MINIATURE, No. 105: Correct Exposure. Read *that* through half a dozen times, then get an exposure meter and use it steadily for a few months, and the problem of exposure will rarely, if ever, present any difficulty.

The development of hand-camera exposures is not mentioned here, almost all amateurs of today either having their exposures developed for them, or themselves using the tank method, neither of which calls for any extended explanation.

News and Comment

We note the recent death of Sir Joseph Swan, the inventor of the Autotype carbon process in general use today. Of course, carbon printing goes back to Mongo Ponton's discovery in 1839, that paper soaked in a solution of potassium bichromate was sensitive to light. Fox Talbot in 1853 published the fact that gelatine impregnated with potassium bichromate became insoluble on exposure to light. Poitevin, who may be regarded as the father of the carbon process, put these two facts together, and in 1855 published the first carbon process proper. Swan's process, substantially that used today, was introduced in 1864. He was also one of the first to manufacture gelatine dry plates, his product being introduced in 1877.

Apart from his prominence in the photographic world, Sir Joseph Swan, working independently, was with Edison the inventor of the carbon-filament incandescent electric lamp. This he introduced in 1879. Honors and full recognition of his genius came to him somewhat late in life, but during these latter few years he has been universally recognized as one of the foremost scientists of his generation.

The first photographic catalogue to be printed by Alcogravure is the new lens-and-shutter catalogue of the Wollensak Optical Co., Rochester, N. Y. The illustrations, which closely resemble photogravures, are specimens of portraiture and outdoor work made with Wollensak lenses. The chief interest of the catalogue, however, lies in the large amount of detailed, useful information which it gives about the choice of lenses for different kinds of work, and the specialties of the Wollensak Optical Co. It is a catalogue well worth sending for, if you cannot get it from your local dealer.

The publicity department of this fast-growing lens factory is now directed by Mr. J. A. Dawes, who takes the place of Mr. H. O. Bodine. Those who need any special information or help in the matter of lenses, shutters, ray-filters and the like, will find in Mr. Dawes an adviser with a very large range of experience in his field, and a man well worth knowing in many other ways. Write him about your difficulties, mentioning this note as your introduction.

Another pioneer in photography whose death is recorded is Mr. B. J. Edwards, a tireless experimenter and inventor, to whom we owe the first commercially successful isochromatic plates and, perhaps, the first focal-plane shutter. He also constructed some of the earliest machines for plate coating, the manufacture of metal dark slides and metal instantaneous shutters.

The Northern Hilite Reducer is a very handy and useful little abrasive brush, made of spun glass and aluminum, for the local reducing of highlights or contrasty effects or any undesirable density in a negative. It should be very helpful for working in backgrounds, shading and etching negatives and working in draperies. It sells at 15 cents, and every amateur, as well as every professional, should add it to his retouching outfit. Northern Photo Supply Co., Minneapolis, Minn.

The 1914 Kodak catalogue has an attractive pictorial cover in brown and gold—girl, of course. It lists and describes the Kodak line in a very interesting and attractive way. The motto of "Kodak Service" for 1914 is "Make it simpler," and the novelties of the catalogue all tend in this direction. The Vest-pocket Kodak line has two additions: the V-P Kodak with Kodak anastigmat *f*/8, at $12; and another model, the V-P Kodak special with Zeiss-Kodak anastigmat, at $22.50. Another newcomer is the No. 1 Kodak Jr., for pictures 2¼ x 3¼ at $7.50. Thinness and extreme compactness are the features of this model, and the back of the camera is constructed upon a new principle which makes it unusually easy to remove for loading and unloading. There is also a new 1-A Kodak Jr., for pictures 2½ x 4¼, at $9. Among the smaller specialties is announced the Kodak Magnesium Ribbon-Holder, which comprises a compact magazine for storing the ribbon, a convenient holder for burning it, and a ready means of measuring definite lengths of the ribbon for printing on Velox paper, lantern-slides and so on. The catalogue can be had from any dealer in photographic supplies.

That "Loveliest Woman" Contest. The opening of the Ansco Company $5,000 Loveliest Woman Contest on May 1 brought an enormous correspondence to the offices of the Ansco Company, necessitating an addition to the regular clerical force to handle the inquiries for entry blanks and information. Evidently, this will be one of the most popular photographic competitions ever announced in this country. The awards, ranging from $500 to $50 for a single photograph—$5,000 in all—are unusually generous, and the subject matter of the competition is one in which everybody is, to say the least, interested. If you have not secured your entry blank, see your Ansco dealer right away, or write Ansco Company, Binghamton, N. Y., for full details.

The women workers in photography are making splendid progress. In the current issue of "Wilson's Photographic Magazine" there are many examples of their work in portraiture, with an interesting article, "How Women Have Won Fame in Photography." This number of "Wilson's" contains forty portraits of or by women photographers. Price 25 cents. Edward L. Wilson Co., 122 East 25th Street, New York City.

An exhibition of photographs by Mr. Clarence H. White was given during the month of April at the studio of Spencer Kellogg, Jr., Buffalo. It was one of a long series of "One-Man Exhibitions," which Mr. Kellogg has during the past year or so provided for the art-loving people of his city. The announcements of these exhibitions are usually accompanied by a discriminating foreword concerning the exhibitor and his work. At the earlier exhibitions, the pictures of Mr. F. Holland Day, Mr. Geo. H. Seeley, Mr. W. H. Porterfield and other pictorialists, were shown. Mr. Kellogg deserves great praise for his good work in promoting these one-man shows, which must have given pleasure and inspiration to thousands of his fellow citizens.

The 1914 catalogue of Voigtlander lenses and cameras gives the revised price-list effective April 1. The Voigtlander line comprises anastigmats for almost every different kind of photographic work, projecting lenses, telephoto lenses, shutters and cameras. The catalogue is interestingly illustrated, and offers a pleasant half-hour to anyone who will send for it. Voigtlander & Sohn, 240 East Ontario Street, Chicago.

Mr. A. Radclyffe Dugmore, who now resides permanently in England, recently lectured before the Royal Photographic Society on "Stalking African Big Game with the Camera." The lecture, which was illustrated with magnificent colored lantern-slides, was received with great enthusiasm. An exhibition of Mr. Dugmore's photographs is now being given at the rooms of the Royal Photographic Society.

The 1914 Convention of the Photographers' Association of America was held at Atlanta, Ga., during the week ending July 17. Among the features of the convention were working demonstrations of the use of the air-brush, negative-making, printing, masking and dodging, making photographs for publication, the application of art principles in portraiture, and commercial photography. It was expected that the attendance this year would exceed 2,000 photographers, but, according to the report, only 800 turned up, a new low record for the P. A. of A.

The Fifth Professional Photographers' Congress of Great Britain was held in London during May. The membership of the Association now numbers 354. According to the figures given at the Congress, there are about 5,000 professional photographers in Great Britain.

The widespread appreciation given by American amateurs and professionals to "Photograms of the Year" as the best among the pictorial annuals, suggests that American photography should be more fully represented in "Photograms." The editor of "Photograms of the Year," Mr. F. J. Mortimer, 52 Long Acre, London, W. C., will be pleased to receive examples of the work of American pictorialists. These should be sent without delay, as the work of selection is now beginning and will be complete before the middle of August.

A remarkable bit of photographic journalism is the June number of "American Photography," edited by Mr. Frank Roy Fraprie. This is the 25th Anniversary Number of the "A. P.," and contains almost 100 pages, with an illustration on practically every page, and a photograph in colors from life by the Polychromide process. We congratulate Editor Fraprie on the success of his work.

I must make room for a brief word of welcome for "Platinum Print," a new photographic magazine for pictorial workers, of which four numbers have already appeared. The sub-title of "Platinum Print," is "A Journal of Personal Expression." It has few pages as yet, but the quality of its information and the beauty of its illustrations deserve the highest praise. The worker reading this note should see "Platinum Print" for himself. 15 cents per copy; $1 per year. 2 East 29th Street, New York.

Fayette J. Clute is giving the world many good things in his "Camera Craft" (San Francisco, $1 per year). The May number has beautifully illustrated articles on amateur portraiture; night-photography; the advantages of the short-focus anastigmat; making the camera pay; and the usual departments by the editor and Dr. H. D'Arcy Power.

The Ensign Folding Reflecting Camera (G. Gennert, New York) is a remarkable example of compactness in camera construction. The model for pictures 3¼ x 4¼ folds into a bulk 6½ x 6½ x 3 inches, but when extended is thoroughly rigid and firm for practical work. It is fitted with the Carl-Zeiss Tessar lens, F: 4.5, the Ensign focal-plane shutter; for use with plates or filmpack; weight 4 pounds. The shutter speeds range from time to 1-1000th part of a second, all speeds being set by one dial, the shutter being silent and smooth in its motion. The price of the camera with three plate-holders is only $150.

Probably no photographic contest was ever so broadly or so interestingly advertised as the Ansco "Loveliest Woman" Competition. We are not surprised to hear that several thousands of entries have already been received by the Ansco Company and that further entries are coming in daily. Everyone who knows where to find a lovely woman and has or can borrow a camera should ask the nearest Ansco dealer for a copy of the rules governing this competition.

Many of my readers will be interested to know that Mr. A. J. Jarman is now writing exclusively for "The

Bulletin of Photography," Philadelphia ($1.75 per year, postfree). Mr Jarman's articles almost invariably deal with practical ways of doing things, methods and processes not elsewhere available. Thus, recent issues of the "Bulletin" have given his articles on "Photographs on Watch-Caps, Watch-Dials and the Like;" "Home-made Trays for Photographic Use," and so on. His contributions to photographic literature are always worth seeking out. Hence my readers should keep an eye on the "Bulletin."

We have many inquiries as to where amateurs can obtain a good reference book on photographic formulæ, Since "Figures, Facts and Formulæ of Photography" went out of print, the only book of this sort obtainable is "Photographic Formulæ," published by the Berlin Aniline Works, 213 Water Street, New York. Ten cents and an Agfa label sent to this address will secure a copy of this useful volume.

During a visit to the Motion-Picture Exposition, held a few weeks ago at the Grand Central Palace, New York, I had the pleasure of meeting Mr. H. Oliver Bodine, who has severed his connection with the Wollensak Optical Co., and is now manager of the Raw Film Supply Co., 15 East 26th Street, New York. This house makes a specialty of the Agfa and Gevaert negative and positive films for motion-picture work. These are the standard European films and are very widely used in this country. Mr. Bodine was enthusiastic over the remarkable growth of the motion-picture business, and reports that amateur and professional photographers are looking into the wonderful possibilities of the motion-picture as a source of revenue. We have in preparation a monograph dealing with this field, which we hope to publish in THE PHOTO-MINIATURE before the year is out. This will give our readers full information about these possibilities.

Books and Prints

Handbook of Photomicrography. By H. Lloyd Hind and W. Brough Randles. 292 pp., 6 x 9 inches; 164 illustrations, including 44 plates, 8 three-color reproductions of direct color photomicrographs; 85 half-tones and 71 text illustrations; index. Cloth, price, $2.50. Postage, 18 cents. New York. E. P. Dutton & Co.

A careful reading of this beautifully printed volume tells us that its authors were well equipped for their work, and by careful collaboration have produced a thoroughly satisfactory handbook for the worker in photomicrography. While not too severely technical in treatment, the authors approach their subject from a wholly practical viewpoint, describing carefully both the photographic and microscopic technique required in the production of successful photomicrographs. Cinemato-micrography is interestingly dealt with, in addition to sections upon everyday photo-micrographical work. The plates, both in black and white and colors, are beautifully printed, and the book is furnished with a very satisfactory index.

The Photography of Colored Objects. By C. E. Kenneth Mees, D. Sc. 64 pp., with 14 half-tone illustrations and photogravure frontispiece. Paper boards, 50 cents.

Contents: I.—The Nature of Color. II.—The Relative Sensitiveness to Colored Light of the Eye and of Photographic Plates. III.—The Multiplying Factor of any Sharp-cut Filter; on Various Orthochromatic Screens. IV.—The Rendering of Color Contrasts; Obtaining Color Contrast; Obtaining Color Contrast for Special Purposes. V.—Portraiture and Color Sensitive Plates. VI.—Photographing Colored Objects for Reproduction. VII.—Landscape Photography. VIII.—Tri-color Photography.

Orthochromatic Filters. By C. E. Kenneth Mees, D. Sc. 56 pp., with 31 half-tone illustrations and a color chart. Paper boards, 50 cents.

Contents: I.—The Purpose and Use of Ortho Filters. II.—The Efficiency of Filters. III.—The Adjustment of the Filter to the Plate. IV.—The Multiplying Factor of a Filter. V.—The Use of Contrast Filters. VI.—The Optical Properties of Filters. VII.—The Fitting of Filters. VIII.—The Care of Filters.

The Art and Practice of Photographing Paintings. (Wratten & Wainwright—Kodak Ltd., London.) 24 pp.; 18 illustrations; paper covers, 25 cents.

A practical working guide. The treatment of old oil paintings, modern paintings, the correct lighting, the best lens to use, working in the studio, away from the studio, in the open air, by artificial light, the position of the camera, plates and filters to use for various colors, correct values, exposure.

The Modern Method of Photographing Furniture. A handbook of practical information on the production of the finest photographs of furniture by the simplest means. 16 pp. 8 plates; price 25 cents.

To meet an occasional but persistent demand for these four monographs—of English origin, but useful to the American worker, inasmuch as Wratten & Wainwright's specialties are now obtainable in the American market, we have imported a few copies, and shall be pleased to send them to those needing them on receipt of published price. Orders should be sent direct to Tennant and Ward, 103 Park Avenue, New York, as we cannot supply these items through dealers.